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National Potato Germplasm Evaluation and Enhancement Report, 1982

Fifty-third Annual Report
by Cooperators

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Compiled and Edited
by
Raymon E. Webb
Vegetable Laboratory
Horticultural Science Institute
Beltsville Agricultural Research Center
Beltsville, Maryland

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TABLE OF CONTENTS

UNITED STATES DEPARTMENT OF AGRICULTURE	1
Beltsville Agricultural Research Center	
Beltsville, Maryland, and Chapman and	
Aroostook Farms, Presque Isle, Maine,	
R. E. Webb, P. Baum, G. W. L. Walter, and	
R. W. Goth, USDA, Beltsville, Maryland, and	
D. R. Wilson, Presque Isle, Maine	
INTERREGIONAL POTATO INTRODUCTION PROJECT (IR-1)	11
R. W. Ross and R. E. Hanneman, Jr., Wisconsin	
Agricultural Experiment Station, Madison	
NORTH CENTRAL REGIONAL POTATO TRIALS	13
R. H. Johansen, North Dakota Agricultural	
Experiment Station, Fargo, and Cooperators	
WESTERN REGIONAL POTATO VARIETY TRIALS	26
J. J. Pavék, D. L. Corsini, and Cooperators	
ALABAMA	34
J. L. Turner, H. Bryce, E. L. Carden,	
R. N. McDaniel, F. B. Selman, R. E. Garrett	
M. H. Hollingsworth, J. Eason, M. E. Ruf, and	
W. H. Hearn	
COLORADO	40
D. G. Holm and M. Workman	
FLORIDA	41
J. R. Shumaker, D. P. Weingartner, J. Watts,	
and R. E. Webb	
IDAHO AND EASTERN OREGON	51
J. J. Pavék, D. Corsini, C. Sanger, and	
S. Michener	
INDIANA	56
H. T. Erickson	
LOUISIANA	58
J. F. Fontenot, D. W. Newsom, H. M. Brewer,	
A. C. Miller, W. A. Poillion, and P. Wilson	
MAINE	
S. S. Leach, R. E. Webb, and D. R. Wilson	63
H. J. Murphy and L. S. Morrow	64
A. F. Reeves, R. B. Long, and G. S. Grounds	69

MINNESOTA	88
F. I. Lauer, D. Wildung, J. Wiersma, G. Rau, M. Burke, and R. Wenkel	
NEBRASKA	91
R. B. O'Keefe, E. D. Kerr, and A. Hagen	
NEW YORK (LONG ISLAND)	
J. B. Sieczka, R. C. Neese, and D. D. Moyer	95
R. Loria and B. A. Taborsky	104
NEW YORK STATE	
D. Halseth and C. A. Maatta	106
R. L. Plaisted and H. D. Thurston	124
NORTH CAROLINA	127
F. L. Haynes	
NORTH DAKOTA	131
R. H. Johansen, B. Farnsworth, D. Hahn, G. Secor, and P. Nolte	
OHIO	143
J. Pisarczyk, R. Rowe, E. C. Wittmeyer, F. I. Lower, W. A. Gould, and D. M. Kelly	
OREGON	146
A. R. Mosley, D. C. Hane, M. J. Johnson, C. Stanger, G. E. Carter, and S. James	
SOUTH CAROLINA	152
W. R. Sitterly	
TEXAS	154
J. C. Miller, Jr., and D. G. Smallwood	
VIRGINIA	163
S. B. Sterrett, C. P. Savage, Jr., and M. P. Mascianica	
WASHINGTON	168
M. W. Martin, P. E. Thomas, G. S. Santo, and J. J. Pavsek	
WEST VIRGINIA	183
R. J. Young	
WISCONSIN	194
L. E. Towill and R. E. Hanneman, Jr.	

UNITED STATES DEPARTMENT OF AGRICULTURE
BELTSVILLE AGRICULTURAL RESEARCH CENTER (BARC), BELTSVILLE,
MARYLAND, AND CHAPMAN AND AROOSTOOK FARMS, PRESQUE ISLE,
MAINE

Raymon E. Webb, Philip Baum, George W. L. Walter, and
Robert W. Goth, BARC, and David R. Wilson, Presque Isle,
Maine

BARC

Breeding and Evaluation: Sixty-eight varieties and clones selected for their disease resistance and desirable horticultural characteristics were included in the hybridization block. Sixty-two additional clones screened for resistance to virus Y were used as pollinators among the horticulturally improved clones within the crossing block. Three hundred thirty-nine parental combinations were obtained, yielding approximately 338,000 seed. Twenty seedling tuber progenies totaling about 9,000 tubers were produced for field selection. Approximately 4,000 seedlings segregating for resistance to several viruses, the golden nematode, and processing qualities were screened for resistance to viruses X and Y. Approximately 1,300 selections proved resistant to both viruses. Of approximately 600 virus-resistant clones segregating for resistance to the golden nematode, over 90 percent proved resistant in greenhouse evaluations (Brodie, New York). Eight clones resisting late blight infection in the field proved quite resistant to race 1,2,3,4, in the greenhouse. Four clones bred for resistance to bacterial wilt were equal in resistance to the bacterium as were the resistant parents Ontario and Snowchip. Fifteen clones (eight round whites and seven russets) were selected for interregional adaptability trials during 1983.

First-year seedling tubers were furnished to Colorado, Minnesota, North Carolina, and Chapman Farm (ARS), Maine. Clonal materials for preliminary evaluation were furnished to New York, Pennsylvania, New Jersey, Virginia, North Carolina, Florida, and Mississippi. Advanced clones were supplied to these same States and South Carolina, Alabama, and Michigan. Results of the latter research identified seven russet and eight round white types for interregional trials in 1983.

Clones B8934-4 and B8943-4 were withdrawn from interregional evaluation primarily because the tuber type was not stable under diverse environments. B7805-1 is still under evaluation. Release Notice of B8972-1 as GoldRus is in preparation.

Presque Isle

Planting began on May 12 and ended on June 3. Very dry conditions prevailed during planting and well into July. Yields were down about 30 percent in the seed increase plots as well as in the adaptability trials.

Chapman Farm. Approximately 4,300 seedling tubers were grown, from which 291 selection were made. Eleven hundred forty-six single hill selections were advanced to 12-hill lots. Promising 60-, 80-, and 100-hill lots were regrown for further interregional evaluation.

Aroostook Farm. Varietal collections and older breeding lines were grown for maintenance and distribution to cooperators. Yield and disease-resistance trials were done on Aroostook Farm. Experimental design for all yield trials was a randomized block with four replications of 25 seed pieces each. White tuber trials received 150 pounds NPK per acre, and russet types received 180 pounds NPK per acre banded with a two-row planter. Seed spacing for white tuber trials was 9 inches and for russet trials 12 inches. All plantings were done by hand.

Cultural methods and materials for weed, insect, and disease control were according to local recommendations. Rainfall and temperature during the season are given in Table 1. At harvest, all entries were graded and samples hand selected for specific gravity and quality evaluations. Specific gravity was determined by the air-water method. Following specific gravity determinations, selected samples were divided and placed at 50° F, 45° F, and 40° F storage at 90 percent relative humidity.

Samples stored at 50° F and 45° F were processed into chips after 2 months in storage. Round white tuber amples stored at 40° F were divided into two groups: one group to be reconditioned at 70° F for 1 and 3 weeks prior to frying; and one group to be fried direct from 40° F after 4, 4.5, and 5 months' storage if processing data from the 50° F stored group indicated potential low reducing sugar content buildup at that temperature. Russet samples were also processed into french fries.

Potato chips were made from each sample by cutting the russet tubers in half and taking a 1/16-inch-thick slice from each tuber with a rotary food slicer. Slices were rinsed in water and placed on paper towels to remove excess water. Chips were then fried at 340° F in Primex vegetable shortening until bubbling ceased.

A french fry plug, 3/8 inch in diameter, was cut from each half of the tubers in the sample. After plugs were trimmed, rinsed, and excess water removed, they were fried at 365° F in Primex shortening for 5 minutes.

Each potato chip and french fry was classified after frying into color classes. Chip classes ranged from 1 = very light to 10 = very dark. French classes ranged from 1 = very light to 5 = very dark. Weighted averages were calculated by multiplying the number of chips or fries in each color

class by the color class, totaled, and divided by the number of chips or french fries in each sample. Color ratings were made by using the PCII reference color chart 1206-U.

After color classification, each french fry plug was broken open and internal texture classification as 1 = mealy, 2 = intermediate, or 3 = soggy, and a weighted texture index calculated.

Summary

B9140-32, B9192-1 (round whites), B9398-2 and B9540-62 (russets) appeared to be the most promising advanced clones, based on disease and quality evaluations to date. Clones from two sources of resistance to virus Y proved to be good pollen sources to expand the genetic base of Y resistance stocks possessing resistance to other diseases. B9518-3 processed into satisfactory chips after 5 months in storage at 40° F. The clone is a good pollen producer and is serving as a base parent to expand clonal materials with the potential of processing direct from low-temperature storage.

BARC Table 1. Weekly average maximum and minimum temperature and weekly rainfall, Aroostook Farm, Presque Isle, Maine, 1982.

Week Ending	Avg. Temperature F		Rainfall
	Min.	Max.	Inches
May 8	36	67	-
15	41	59	.11
22	30	66	.15
29	42	76	.15
June 5	47	74	1.39
12	46	77	-
19	45	70	.91
26	48	71	.89
July 3	46	72	.32
10	49	81	-
17	52	85	-
24	58	82	1.12
31	50	77	1.18
Aug. 7	47	72	.38
14	52	72	.92
21	49	78	.24
28	45	71	2.47
Sep. 4	44	66	1.27
11	45	69	.81
18	51	71	1.03
25	44	64	.07
Oct. 2	44	64	1.18
9	35	59	.19
16	32	53	.38
23	36	55	-
30	34	58	.02
Total			15.18

BARC Table 2. Yield, tuber size, distribution, and quality characteristics of round white clones harvested 120 days after planting on Aroostook Farm, 1982.

Pedigree	Mkt Cwt	%	% Tuber Size Distribution							Tuber Rating ¹	Sp. Gv. ²	Chip Color ³			
			1-7/8"- 2-1/4"- 3-1/4"-									50°F 2 mos.	40°F 4 mos.	40°F-70°F 27 days	45°F 5 mos.
			<1-7/8"	1-7/8"	2-1/4"	3-1/4"	4"	>4"							
B7805-1	260	88	7	19	69	12	4	3	70	7.6	8.0	8.0	7.5		
B8091-8	353	86	12	39	55	6	2	3	75	8.2	8.9	8.9	8.1		
B8486-1	235	82	18	39	57	4	0	3	78	5.3	6.6	6.0	6.0		
B8685-5	292	89	11	47	50	2	0	3	79	6.8	6.2	6.3	6.7		
B8701-10	336	93	8	31	67	1	0	3	86	5.4	6.5	6.5	6.1		
B8706-7	323	85	11	34	53	13	3	3	75	7.4	8.2	7.1	7.9		
B8706-11	216	79	21	62	36	1	0	3	77	6.0	7.4	7.2	6.9		
B8710-1	296	86	14	47	52	1	0	4	73	8.1	9.0	10.0	8.8		
B8710-16	382	93	7	27	66	7	0	4	77	8.0	8.1	8.8	8.0		
B8798-20	269	91	9	39	58	3	0	3	75	6.9	7.8	7.9	7.5		
B9140-4	226	73	27	82	18	-	0	3	77	7.5	8.2	7.9	7.5		
B9140-14	271	87	13	50	49	1	0	2	75	7.0	8.8	7.9	7.8		
B9140-32	295	87	13	59	41	-	0	3	83	5.6	7.3	5.9	6.1		
B9192-1	362	93	7	36	57	7	0	4	75	6.0	7.8	8.1	6.6		
B9224-6	233	73	27	56	43	1	0	3	76	7.7	8.5	8.1	8.1		
Atlantic	324	91	8	29	61	10	1	3	82	6.9	7.7	6.7	7.4		
Belchip	334	91	9	23	68	9	0	3	80	5.9	7.6	7.2	6.4		
Chipbelle	299	87	13	36	55	9	0	3	85	5.9	7.4	6.3	6.3		
LSD 5%	63								4						

¹1 = poor; 5 = outstanding.

²1.0 omitted.

³Chips: 1-7 satisfactory.

BARC Table 3. Yield, tuber size, distribution, and quality characteristics of round white clones harvested 120 days after planting on Aroostook Farm, 1982.

Pedigree	Mkt Cwt	%	% Tuber Size Distribution							Tuber Rating ¹	Sp. Gv. ²	Chip Color ³				
			1-7/8"-2-1/4"			3-1/4"-4"						50°F 2 mos.	40°F 4 mos.	40°F-70°F 27 days	45°F 5 mos.	
			<1-7/8"	2-1/4"	3-1/4"	4"	>4"									
B9286-1	203	80	20	52	46	2	0	5	68	9.2	10.0	9.8	10.0			
B9286-4	237	79	21	41	50	9	0	6	73	9.0	9.9	9.1	10.0			
B9311-7	241	85	15	48	49	4	0	5	77	7.1	7.9	6.2	7.1			
B9335-3	272	88	12	30	60	10	0	6	75	6.8	7.6	7.6	7.5			
B9335-7	226	86	14	49	49	1	0	5	71	8.0	9.2	8.5	8.5			
B9335-60	190	83	17	42	50	9	0	5	75	7.7	8.2	7.5	8.0			
B9336-24	204	82	18	47	47	5	0	6	78	6.8	7.9	7.1	7.0			
B9336-27	252	86	14	45	47	7	0	4	82	7.5	7.8	6.8	8.0			
B9340-13	225	88	12	50	45	5	0	7	76	6.5	7.3	8.4	7.1			
B9384-4	166	70	30	69	21	0	0	4	70	6.3	7.5	7.1	7.3			
B9384-6	308	91	8	28	61	12	1	5	72	7.0	8.2	8.0	7.8			
B9399-23	183	73	27	67	32	1	0	4	76	6.1	7.7	7.1	7.0			
B9468-1	249	89	11	48	50	2	0	5	78	8.6	8.7	8.6	8.0			
B9507-11	260	85	14	50	47	3	1	5	76	5.6	6.5	7.2	6.4			
B9530-13	196	86	14	47	51	2	0	5	90	5.5	6.4	5.6	6.1			
Atlantic	245	90	10	30	58	12	0	6	82	6.5	7.9	6.5	7.2			
Monona	221	91	9	41	51	9	0	5	72	5.3	6.4	5.1	5.5			
Chipbelle	300	91	8	37	52	11	1	5	90	6.2	7.9	5.6	6.6			
LSD 5%	52								4							

¹ ² ³ - See footnotes Table 2.

BARC Table 4. Yield, tuber size, distribution, and quality characteristics of round white clones harvested 120 days after planting on Aroostook Farm, 1982.

Pedigree	Mkt Cwt	%	% Tuber Size Distribution					Tuber Rating ¹	Sp. Gv. ²	Chip Color ³			
			1-7/8"-2-1/4"		2-1/4"-3-1/4"		>4"			50°F 2 mos.	40°F 4 mos.	40°F-70°F 27 days	45°F 5 mos.
			<1-7/8"	2-1/4"	3-1/4"	4"							
B8941-14	119	79	21	46	53	1	0	5	73	7.2	8.0	7.1	7.2
B9541-21	162	75	25	57	43	0	0	5	80	5.5	7.3	6.0	6.6
B9541-27	251	93	7	40	57	3	0	6	75	6.9	8.0	7.6	7.1
B9541-43	158	76	24	68	32	0	0	4	69	6.6	7.9	7.9	6.8
B9542-7	289	89	11	45	52	3	0	5	67	6.9	7.8	6.6	7.0
B9638-10	251	88	12	47	51	2	0	5	78	7.2	8.6	7.5	7.6
B9507-14	335	94	6	44	51	2	0	5	83	5.2	6.5	6.8	6.1
B9515-2	221	82	18	67	33	0	0	5	74	5.1	7.1	6.6	6.1
B9516-8	277	96	4	19	72	9	0	6	89	5.5	6.1	5.6	5.9
B9518-1	168	81	19	71	30	0	0	5	81	5.5	6.5	6.6	6.2
B9518-3	194	80	20	67	33	0	0	5	89	5.1	5.2	5.4	5.7
B9528-8	256	88	11	37	58	5	1	5	72	6.4	7.4	6.4	6.5
B9528-9	259	95	5	31	65	5	0	5	88	7.1	7.2	6.3	6.5
B9536 3	306	89	11	44	54	3	0	5	91	6.5	7.3	6.4	6.8
B9547-8	192	86	14	40	56	4	0	5	87	6.9	9.1	7.6	7.5
Monona	200	88	12	42	57	1	0	5	68	5.4	7.2	6.2	5.5
Norchip	276	89	11	36	56	8	0	5	78	6.7	8.6	7.7	7.0
Chipbelle	327	92	8	38	57	5	0	6	89	6.7	8.6	6.1	6.5
LSD 5%	36								4				

¹ ² ³ - See footnotes Table 2.

BARC Table 5. Yield, tuber size, distribution, and quality characteristics of russet clones harvested 120 days after planting on Aroostook Farm, 1982.

Pedigree	Mkt Cwt	%	% Tuber Size Distribution					Tuber Rating ¹	Sp. Gv. ²	French-Fry Color & Texture ³					
			1-7/8"- 2-1/4"- 3-1/4"-							50 F		45 F		40 F-70 F	
			<1-7/8"	1-7/8"- 2-1/4"	2-1/4"- 3-1/4"	3-1/4"- 4"	>4"			2 mos.		5 mos.		25 days	
										FF	Tex	FF	Tex	FF	Tex
B8833-6	186	79	21	69	31	0	0	5	78	3.1	2.0	2.7	2.0	3.0	2.0
B8934-4	308	90	10	41	54	5	0	4	76	2.1	1.9	2.2	1.9	2.1	1.9
B8943-4	223	81	19	51	47	2	0	4	79	3.3	2.0	3.6	2.0	3.5	2.1
B8972-1	201	71	29	63	35	2	0	7	78	2.2	1.8	2.3	1.9	2.9	2.0
B9137-9	251	90	9	36	55	9	1	6	75	2.5	2.0	2.7	2.0	2.5	1.9
B9333-4	126	60	40	58	42	0	0	5	72	3.4	2.0	4.0	2.0	3.9	2.0
B9391-2	240	85	15	53	44	3	0	5	76	3.2	2.0	3.6	2.0	3.7	2.2
B9395-25	264	86	14	31	62	7	0	5	80	3.0	2.0	3.9	2.1	2.9	2.4
B9398-2	221	82	16	36	52	12	2	3	77	2.4	1.7	2.6	2.0	2.3	1.9
B9399-1	196	81	19	47	47	6	0	5	74	2.6	1.9	3.2	2.0	3.3	2.0
B9400-5	254	83	14	34	54	11	3	5	73	3.5	2.1	3.9	2.3	4.3	2.4
B9523-10	275	87	13	44	47	9	0	5	68	3.6	1.9	4.1	2.0	4.1	2.0
B9523-15	241	83	13	53	43	4	0	4	74	2.8	2.0	3.4	2.0	3.6	2.1
BelRus	218	86	14	45	54	1	0	6	82	2.5	1.8	3.3	2.0	3.6	2.1
Russette	273	93	3	19	63	19	4	6	82	3.6	2.0	3.8	2.0	3.4	2.1
LSD 5%	36								4						

¹1 = poor; 5 = outstanding.

²1.0 omitted.

³French Fry Color & Texture: 1-2 = satisfactory.

BARC Table 6. Yield, tuber size, distribution, and quality characteristics of russet clones harvested 120 days after planting on Aroostook Farm, 1982.

Pedigree	Mkt Cwt	% Mkt	% Tuber Size Distribution						Tuber Rating ¹	Sp. Gv. ²	French-Fry Color & Texture ³					
			1-7/8" - 2-1/4" - 3-1/4" - 4" - >4"								50°F		45°F		40°F-70°F	
											2 mos.		5 mos.		25 days	
											FF	Tex	FF	Tex	FF	Tex
B9538-6	297	91	9	34	64	2	0	5	75	3.7	2.1	3.8	2.2	4.0	2.0	
B9539-6	215	71	29	59	41	0	0	4	65	3.2	2.0	3.5	2.2	3.0	2.2	
B9539-7	197	70	30	58	40	2	0	4	69	3.0	2.0	3.2	2.1	3.7	2.2	
B9539-9	272	81	19	54	45	1	0	5	80	2.2	1.7	2.2	2.0	3.0	2.0	
B9539-14	337	89	11	41	53	6	0	4	75	3.9	1.9	4.0	2.0	4.6	2.1	
B9539-18	229	76	24	67	33	0	0	5	78	3.3	1.9	3.9	2.1	3.5	2.0	
B9539-21	265	95	4	26	70	4	1	6	70	3.3	2.0	3.6	2.1	4.0	2.3	
B9540-2	292	92	8	33	59	9	0	7	69	2.5	2.0	2.3	2.0	3.0	2.0	
B9540-5	320	84	13	36	55	9	3	4	83	2.7	1.9	3.4	2.0	3.6	2.0	
B9540-16	306	88	12	37	55	8	0	4	85	2.9	2.0	3.5	2.0	3.3	2.1	
B9540-22	321	89	8	32	57	11	3	3	72	2.4	1.8	2.9	2.0	3.1	2.0	
B9540-27	179	77	23	62	38	0	0	4	69	2.3	2.0	2.5	2.0	2.1	2.0	
B9540-29	270	82	18	47	47	6	0	5	75	2.1	1.9	2.1	2.0	2.6	2.1	
BelRus	225	84	16	51	48	2	0	6	81	2.8	1.8	3.0	2.1	3.5	2.0	
Centennial	321	87	9	23	64	13	4	5	73	4.0	2.1	4.6	2.3	5.0	2.2	
Russet																
Burbank	352	85	15	42	53	6	0	2	79	3.1	2.0	3.9	2.0	4.2	1.9	
LSD 5%	41								3							

¹ ² ³ - See footnotes Table 5.

BARC Table 7. Yield, tuber size, distribution, and quality characteristics of russet clones harvested 120 days after planting on Aroostook Farm, 1982.

Pedigree	Mkt Cwt	% Mkt	% Tuber Size Distribution							Tuber Rating	Sp. Gv.	French-Fry Color & Texture ³					
			1-7/8"- 2-1/4"- 3-1/4"- 4"- >4"									50°F		45°F		40°F-70°F	
												2 mos.		5 mos.		25 days	
												FF	Tex	FF	Tex	FF	Tex
B9540-53	238	81	19	48	43	10	0	5	76	1.9	1.7	2.2	2.0	2.4	1.9		
B9540-55	247	79	20	49	42	10	1	7	64	2.1	1.9	2.2	2.0	2.7	2.0		
B9540-62	312	86	10	31	60	10	4	7	70	2.3	1.7	2.8	2.0	3.2	2.0		
B9553-1	201	67	32	58	41	1	1	5	73	3.5	2.0	3.6	2.0	3.9	1.8		
B9553-6	218	73	27	50	49	1	0	4	78	2.2	1.6	2.8	2.0	2.5	1.7		
B9553-10	202	64	36	59	40	1	0	4	71	3.1	2.0	3.3	2.0	3.8	2.1		
B9569-2	206	71	29	47	43	10	0	5	73	3.8	2.0	4.2	2.0	4.4	1.9		
B9596-2	292	88	11	41	50	10	1	6	79	3.5	2.0	4.0	2.1	4.4	2.0		
B9648-9	291	81	19	40	45	9	0	6	70	2.5	1.9	3.0	2.0	4.5	2.0		
B9648-15	303	90	10	30	57	13	0	6	73	4.2	2.0	4.5	2.0	4.5	2.0		
B-TH-1	315	88	8	29	59	13	4	4	82	3.1	1.9	3.3	2.0	3.9	2.0		
B-TH-2	217	82	17	49	47	5	1	5	84	2.9	1.7	3.3	2.0	3.8	2.0		
B-TH-3	249	88	12	41	49	10	0	5	84	2.6	2.0	3.0	2.0	3.7	1.9		
B-TH-5	261	90	10	43	53	4	0	5	85	2.3	1.7	3.2	2.0	3.8	2.0		
B9219-2	283	91	9	35	55	11	0	6	74	3.2	2.0	3.5	2.0	4.1	2.1		
BelRus	216	81	19	35	57	8	0	5	81	2.7	1.8	3.2	2.0	3.7	2.0		
Centennial	286	82	9	28	57	15	9	5	72	4.0	2.1	4.8	2.3	5.0	2.4		
Russet																	
Burbank	317	80	18	46	42	18	2	1	79	3.0	2.0	3.3	2.0	3.5	1.9		
Russette	278	88	7	19	62	18	5	5	78	3.4	2.0	3.8	2.0	4.3	2.1		
LSD 5%	30								4								

1 2 3

- See footnotes Table 5.

INTER-REGIONAL POTATO INTRODUCTION PROJECT (IR-1)

R. W. Ross and R. E. Hanneman, Jr.

Introduction of New Stocks. Ninety-two accessions, 87 in the form of true seed, were added to the collection. Over half received were Colombian collections, the remainder comprising almost equal numbers of Bolivian and Mexican collections. Five tuber clones were received from England.

Preservation and Increase of Stocks. Approximately 90% of the introductions contained in the collection are maintained as true seed. Satisfactory seed increases of 179 species introductions and intraspecific hybrids were obtained under glass, fiberglass or screen. Recently-harvested seed samples of 162 species introductions were packeted for storage in the National Seed Storage Laboratory. Germination percentages of 663 seed lots 2-22 years of age were determined.

Fifty-six introductions have been placed into meristem culture of which 55 were heat treated as tubers. Twelve PVX and PVS free lines were found, bringing the total number of meristem-derived virus-free lines to 24. One hundred and one plants, consisting of meristem-regenerants and clonal lines, were tested serologically for PVX and PVS using the latex agglutination technique. Five hundred and two tests for potato spindle tuber viroid (PSTV) by polyacrylamide gel electrophoresis were made on wild and cultivated species, foreign varieties, research stocks, and material from preliminary experiments designed to test for PSTV in the yearly seed increase. Only one clone of 59 species clones and foreign cultivars tested had PSTV. Ten families (210 plants) from the 1982 true seed increase that flowered poorly were placed into shoot-tip culture to save them from loss. A modified culture medium for long-term plantlet storage has been devised.

Classification. Twenty-five herbarium specimens were prepared from eight accessions of two Peruvian species, and forwarded at the request of taxonomist C. M. Ochoa for use in studies to establish their relationship. One hundred and nine herbarium specimens were collected at 52 sites throughout several Mexican states for inclusion in the IR-1 herbarium and are available for taxonomic use. More than 4,000 herbarium mounts representing specific and interspecific variability of 99 species are now available for taxonomic use.

Distribution of Stocks. Seed and tuber shipments were sent to potato workers in 21 states within this country, as well as to those in 17 other countries. Shipments included 2,442 seed and 2,280 tuber samples of species introductions, and 289 tuber samples of germplasm, involving species introductions, developed by the cooperative USDA-Wisconsin Genetics and Cytogenetics Project.

Copies of a listing of 237 species introductions available this year in the form of tuber families as well as true seed were distributed to 297 potato workers. This mailing elicited 23 responses that depleted most of the tuber families offered.

All available provenance data identifying 902 true seed introductions, received direct, were assembled and submitted for permanent Plant Inventory (PI) Number assignment. All will now be included in the revised inventory of available species germplasm.

Evaluation of Stocks. The somatic chromosome numbers of 53 species introductions were determined in the laboratory. The more recent accessions are being steadily evaluated for characters of economic importance through the cooperative efforts of state, federal, and foreign laboratories.

Usefulness of Findings. The major objective of the Inter-Regional Potato Introduction Project is to promote and facilitate the improvement of the commercial potato in the United States by providing a readily available reservoir of useful breeding stocks. Breeders are constantly searching for new sources of superior germplasm and for ways to incorporate desirable new genes into adapted commercial varieties. Accomplishment of the major objectives of this program must be measured largely by the success with which new, improved varieties meet the needs of commercial production.

Two new potato varieties, Crystal and Sangre, were released for commercial production in 1981-1982. The number of foreign introductions entering into their pedigrees are 13 and six, respectively. One hundred fifty-four of the 158 potato varieties developed and released in the United States since 1932 have two or more foreign introductions in their pedigree. These varieties presently comprise about 65% of the annual seed potato production in the United States.

Basic research programs conducted in several states and other countries continue to provide information concerning the potential value and diversity of the Solanum species, and consequently the knowledge necessary for more effective utilization of the IR-1 germplasm collection. During 1982 41 papers, 9 abstracts and 10 theses reported the use of Solanum introductions.

NORTH CENTRAL REGIONAL POTATO TRIALS

R. H. Johansen and Cooperators^{1/}

Potato Cultivar Trials

The North Central Regional Potato Cultivar Trials have now been conducted for 32 years. There are at present 14 states and two provinces participating in the trials; however, this past season the trial in Missouri was lost due to weather conditions. In most cases, the top cultivars grown in the United States and Canada have been tested in the North Central Regional Trials prior to their introduction.

Recent Potato Cultivars. No new cultivars tested in the North Central Trials were released in 1982.

Cooperating States and Provinces.

State or Province	Date Planted	Date Harvested	Total Days to Harvest
Alberta	5/11	9/12 & 13	135
Manitoba	5/14	9/17	127
Colorado	5/6	9/11	129
Indiana	4/12	7/29	109
Iowa	4/28	8/26	120
Kansas	4/30	7/28	90
Kentucky	4/14	9/16	156
Louisiana	2/25	6/1	96
Michigan	4/3	9/21	141
Minnesota	4/22	8/30	131
Nebraska	5/26	9/21	119
North Dakota	5/24	9/29	120
Ohio	5/14	9/13	123
South Dakota	4/28	9/9	134
Wisconsin	4/29	9/23	147

Environmental Conditions. Soil type ranged from clay loam to sand. Most trials were planted on sandy or silt loams.

Cultural Practices. Fertilizers, fungicides, insecticides, vine killers, herbicides, etc., were based on local conditions.

^{1/} Indiana, H. Erickson; Kansas, J. Greig; Louisiana, J. Fontenot; Michigan, R. Chase; Minnesota, F. Lauer; Missouri, V. Lambeth; Nebraska, R.O 'Keefe; North Dakota, R. Johansen; Ohio, J. Pisarczyk; South Dakota, P. Prashar; Wisconsin, D. Kichefski, S. Peloquin and J. Schoenemann; USDA - R. Webb; Alberta, S. Molnar; Manitoba, W. Russell; USDA-Idaho, J. Pavek; Iowa, W. Summers; Colorado, C. Urano; Kentucky, J. Snyder.

Insecticides used were Belmark, Sevin, Thiodan, Guthion, Monitor, Pydrin, Thimet, Diazinon, Di-Dyston, Azodrin and Temik. The following fungicides were used: Diathane, Bravo, Manzate, Diathane M 45 Brand, M 200, Maneb. Herbicides used were Eptam, Sencor, Ambush, Lasso/Lorox. Vines were killed by roto-beating and by such vine killers as Reglone, Diaquat, Dinitro + oil. At some locations, vines were not killed.

Weather and Growing Conditions. Temperatures in the northern states were unusually cool and quite wet during planting and the early part of the growing season. However, during the latter part of the season it was generally quite warm and dry in several northern states. In Louisiana, temperatures and rainfall were ideal throughout the growing season. Kentucky had somewhat above normal temperatures and near normal rainfall. It was cool and dry in Colorado, however irrigation water was applied 14 times throughout the growing season. In North Dakota rainfall was 5.24 inches below normal. A hard frost in Manitoba on August 26 killed 3/4ths of the vines and stopped further growth. On the same date a light frost also occurred in North Dakota. Wisconsin had an average growing season with average temperatures and fair rainfall distribution, however 13.5 inches of irrigation water was applied to the plot. Alberta had cool and wet weather conditions throughout the growing season and during harvest time.

Entries. Entries were received from Nebraska, Wisconsin, Minnesota, North Dakota and Louisiana. The check cultivars, Norland, Red Pontiac, Norchip, Russet Burbank and Norgold Russet were supplied by North Dakota. Iowa did not report any data for Minn. 10504 and Kansas did not report any data for Red Pontiac. Minnesota and Ohio did not report any data for Minn. 9569. Ohio also did not report any data for Minn. 10162. The seed was either not sent to those locations, rogued out or else the seed rotted before or after planting.

Total and U.S. No. 1 Yields. Once again Red Pontiac produced the highest total and U.S. No. 1 yield. Other high yielding selections were Neb. A71.72-1, Minn. 10162, Wisc. 752 and 806R, La 42-38 and ND 534-4Russ. Minnesota reported the highest yields. Total and U.S. No. 1 yields are found in North Central Regional Tables 1 and 2.

Percent U.S. No. 1. Nebraska, Colorado and Iowa reported the lowest percent U.S. No. 1 while the highest percent U.S. No. 1 was reported by Minnesota. Russet Burbank, with an overall average of 61.4 percent U.S. No. 1 was the lowest of all entries in trial.

Maturity. Norland was the earliest maturing entry in trial while Neb. A63.71-1 and Russet Burbank were the latest. Maturity data is found in North Central Regional Table 4.

Percent Total Solids. Wisc. 752 had the highest average percent total solids of all entries in trial while Norland and Red Pontiac were the lowest. Other entries with high total solids

were LA 42-38, ND388-1Russ, Norchip, Minn. 10162 and Russet Burbank. Highest total solids were reported by Manitoba and North Dakota, while Iowa and Louisiana reported the lowest. Percent total solids are found in North Central Regional Table 5.

Scab Reaction. Scab reactions are found in North Central Regional Table 6. Minnesota reported the highest incidence of scab. Several locations reported little or no scab.

Summary of Grade Defects. A high incidence of hollow heart was found in Neb. A 63.71-1 and Minn. 10162 seemed to be quite susceptible to scab. Russet Burbank again had serious second growth. Certain advanced lines are starred (*) to point out various external and internal grade defects (North Central Regional Table 7).

Chip Quality. Chip scores, either Agtron readings or PCII Color Chart scores are found in North Central Regional Table 8. Five states did not report any chip data. Lines Wisc.752, ND55-7, Neb. A 71.72-1, Minn. 10162 and Minn. 10504 appear to have potential as chip cultivars.

Early Blight Readings. Early blight readings are found in North Central Regional Table 9. Seven states did not report any early blight readings.

Overall Merit Ratings^{1/}. Merit ratings are presented for 1980, 1981 and 1982 (North Central Regional Table 10). The following five entries received the highest merit points in 1982. Line ND534-4Russ received the highest merit points followed by Wisc. 752.

<u>Cultivar or Selection</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
ND534-4Russ	--	--	41
Wisc. 752	--	--	35
ND388-1Russ	--	--	24
Minn. 10162	--	--	19
Norchip	19	17	14

^{1/} Merit Ratings

<u>Rating</u>	<u>Points</u>
1	5
2	4
3	3
4	2
5	1

North Central Regional Table 1. Total Yield (Cwt/Acre) - 1982.

Cultivar or Selection	Alb.	Man.	Co.	Ind.	Iowa	Kan.	Kent.	La.	Mich.	Minn.	Neb.	Mo. ⁺	ND	Ohio	SD	Wisc.	Average
<u>Early to Medium Early</u>																	
Minn. 10504	106	141	149	285	ND	355	308	174	194	493	300		201	ND	200	413	255.3
Norland	271	131	202	125	171	286	249	133	335	504	289		217	367	182	469	262.1
<u>Medium to Late</u>																	
Neb. A143.70-2	200	91	311	182	201	307	219	ND	343	503	218		172	378	154	398	262.6
Neb. A71.72-1	356	124	349	229	320	365	252	ND	385	625	206		192	392	269	453	301.2
Neb. A63.71-1	270	73	255	259	149	298	286	ND	481	535	279		130	389	183	515	293.0
Minn. 9569	140	88	94	150	118	188	206	59	159	ND	179		122	ND	160	299	151.0
Minn. 10162	300	134	216	319	135	357	286	148	444	662	224		199	ND	289	493	300.4
La. 42-38	356	201	210	260	281	389	399	195	589	667	390		196	407	305	505	356.7
Wisc. 752	357	158	315	254	299	368	351	183	412	530	342		183	251	334	401	315.9
Wisc. 806R	390	182	264	266	280	425	408	163	588	613	274		185	336	287	545	347.1
ND388-1Russ	462	168	178	210	254	313	272	123	405	397	304		225	378	307	411	293.8
ND534-4Russ	372	148	238	251	284	330	238	134	380	539	298		210	464	280	429	306.3
ND55-7	392	164	220	190	287	400	272	129	392	552	332		237	427	305	350	309.9
Red Pontiac	271	213	397	370	356	ND	462	235	682	746	420		234	529	298	673	420.4
Norchip	487	144	264	250	190	374	344	71	356	451	269		234	385	231	113	284.2
Russet Burbank	307	123	177	202	172	264	292	138	456	553	208		121	297	281	523	274.3
Norgold Russet	351	96	188	238	187	274	288	111	317	425	234		211	480	160	423	265.5
Average	317	140	237	238	230	331	302	143	407	550	298		192	391	248	454	294.1

ND - No Data

+ - Trial was lost due to adverse weather conditions.

North Central Regional Table 2. U.S. No. 1 Yield (Cwt/Acre) - 1982.

Cultivar or Selection	Alb.	Man.	Co.	Ind.	Iowa	Kan.	Kent.	La.	Mich.	Minn.	Neb.	Mo. ⁺	ND	Ohio	SD	Wisc.	Average
<u>Early to Medium Early</u>																	
Minn. 10504	150	103	76	ND	ND	242	295	139	156	488	198		177	ND	162	357	211.9
Norland	182	101	163	ND	123	228	236	89	297	499	132		190	334	165	424	225.9
<u>Medium to Late</u>																	
Neb. A143.70-2	171	83	193	ND	99	233	205	ND	311	503	129		146	304	143	365	221.9
Neb. A71.72-1	309	94	239	ND	250	269	240	ND	320	625	85		144	325	220	360	267.7
Neb. A63.71-1	223	65	156	ND	93	249	273	ND	460	535	153		117	334	166	476	253.9
Minn. 9569	103	68	50	ND	79	162	192	37	122	ND	105		83	ND	138	248	115.6
Minn. 10162	270	91	103	ND	63	301	270	95	383	660	103		156	ND	236	442	264.4
La. 42-38	300	166	145	ND	200	331	384	125	551	667	209		166	330	272	461	307.6
Wisc. 752	306	111	237	ND	250	271	327	148	360	530	238		144	127	278	322	267.1
Wisc. 806R	252	101	188	ND	217	309	379	128	512	613	169		143	294	247	422	286.0
ND388-1Russ	354	146	110	ND	187	273	260	88	360	391	187		190	321	256	356	248.5
ND534-4Russ	299	104	124	ND	230	283	228	125	318	534	180		169	412	241	394	259.4
ND55-7	311	80	146	ND	239	301	250	81	307	552	222		177	316	263	289	252.4
Red Pontiac	182	197	267	ND	242	ND	444	182	627	736	210		193	415	265	631	353.2
Norchip	396	117	201	ND	127	309	330	45	291	451	190		186	309	214	382	253.4
Russet Burbank	211	81	25	ND	44	235	276	50	325	553	45		66	175	212	446	196.1
Norgold Russet	281	64	113	ND	119	204	269	76	241	419	143		161	403	138	353	213.1
Average	255	104	149	ND	160	263	286	101	350	547	159		153	321	213	376	247.0

ND - No Data

+ - Trial was lost due to adverse weather conditions.

North Central Regional Table 3. Average Percent U.S. No. 1 (over 2" Diameter) - 1982.

Cultivar or Selection	Alb. Man. Co.	Ind. Iowa Kan.	Kent. La.	Mich. Minn. Neb. Mo. ⁺	ND	Ohio SD	Wisc.	Average
<u>Early to Medium Early</u>								
Minn. 10504	83	73	51	ND	ND	80	99	66
Norland	67	77	81	ND	71	80	94	67
								88
								88
								86
								90
								80.8
								73.0
<u>Medium to Late</u>								
Neb. A143.70-2	86	91	62	ND	48	76	93	93
Neb. A71.72-1	87	76	68	ND	78	74	95	80
Neb. A63.71-1	83	89	61	ND	62	84	96	83
Minn. 9569	74	77	53	ND	66	86	93	86
Minn. 10162	89	70	47	ND	47	84	94	86
La. 42-38	84	83	69	ND	71	85	96	82
Wisc. 752	86	70	75	ND	83	74	93	81
Wisc. 806R	72	55	71	ND	77	73	93	87
ND388-1Russ	77	87	62	ND	74	87	96	84
ND534-4Russ	80	70	52	ND	81	86	96	80
ND55-7	79	49	67	ND	84	75	92	75
Red Pontiac	67	92	67	ND	68	ND	96	82
Norchip	81	81	76	ND	66	83	96	79
Russet Burbank	68	66	14	ND	24	89	95	55
Norgold Russet	80	67	60	ND	63	74	94	76
								61
								76
								83
								80.9
								81.6
								61.4
								76.5
Average	79	79	61	ND	66	80	95	56
								85
								100
								79
								82
								86
								87
								77.8

ND - No Data

+ - Trial was lost due to adverse weather conditions.

North Central Regional Table 4. Maturity Classification^{1/} - 1982.

Cultivar or Selection	Alb.	Man.	Co.	Ind.	Iowa	Kan.	Kent.	La.	Mich.	Minn.	Neb.	Mo. ⁺	ND	Ohio	SD	Wisc.	Average
<u>Early to Medium Early</u>																	
Minn. 10504	2.0	1.5	2.5	2.0	ND	4.0	4.0	3.0	1.0	ND	2.2	3.5	ND	4.0	2.3		2.67
Norland	2.8	1.0	1.0	1.0	1.0	3.8	1.0	1.0	1.0	ND	ND	3.0	1.0	1.0	1.0		1.46
<u>Medium to Late</u>																	
Neb. A143.70-2	3.5	1.8	2.5	3.0	3.0	3.8	3.5	ND	3.0	ND	1.7	4.5	3.0	3.0	3.0		3.00
Neb. A71.72-1	4.5	2.4	1.5	4.0	4.0	3.0	4.0	ND	4.0	ND	1.7	4.8	3.0	2.0	3.2		3.23
Neb. A63.71-1	5.0	2.7	3.5	5.0	4.0	3.8	5.0	ND	5.0	ND	3.2	5.0	5.0	5.0	4.8		4.38
Minn. 9569	2.0	1.3	1.5	3.0	1.0	3.8	3.0	3.0	3.0	ND	1.3	3.5	ND	3.0	3.2		2.46
Minn. 10162	5.0	1.8	2.0	4.0	1.0	4.0	4.0	4.0	3.0	ND	2.2	5.0	ND	5.0	4.0		3.46
Ia. 42-38	5.0	3.1	3.0	4.0	2.0	3.3	5.0	4.0	5.0	ND	3.5	5.0	4.0	3.0	3.7		3.79
Wisc. 752	4.8	3.0	3.0	3.5	3.0	4.0	4.0	2.0	2.0	ND	2.7	5.0	5.0	2.0	4.0		3.43
Wisc. 806R	5.0	3.5	2.0	3.0	2.0	4.0	4.0	3.0	3.0	ND	2.5	5.0	3.0	3.0	3.8		3.29
ND388-1Russ	4.5	1.5	1.5	2.5	2.0	2.8	4.0	4.0	2.0	ND	2.0	4.0	2.0	3.0	3.5		2.79
ND534-4Russ	3.8	1.5	1.0	3.0	1.0	3.8	3.0	4.0	2.0	ND	1.2	4.3	2.0	4.0	3.7		2.71
ND55-7	4.3	1.4	2.0	2.0	1.0	3.0	3.0	1.0	2.0	ND	2.0	3.8	2.0	1.0	3.5		2.29
Red Pontiac	5.0	2.9	3.5	4.0	3.0	ND	4.0	4.0	3.0	ND	3.7	5.0	3.0	4.0	4.5		3.77
Norchip	4.0	2.0	1.5	2.0	2.0	4.0	4.5	3.0	3.0	ND	1.5	3.5	3.0	5.0	3.0		3.00
Russet Burbank	5.0	2.1	2.5	5.0	5.0	3.8	5.0	5.0	5.0	ND	1.7	4.5	5.0	3.0	4.3		4.00
Norgold Russet	3.5	1.2	1.5	3.0	1.0	3.0	3.5	3.0	2.0	ND	1.5	3.8	2.0	3.0	3.3		2.50
Average	3.5	2.1	1.9	3.2	2.3	3.6	3.8	3.1	2.9	ND	2.1	4.3	3.1	3.2	3.5		3.07

1/ 1. Very early - Norland Maturity

2. Early - Irish Cobbler Maturity

3. Medium - Red Pontiac Maturity

4. Late - Katahdin Maturity

5. Very Late - Russet Burbank Maturity

ND - No data

+ - Trial was lost due to adverse weather conditions.

North Central Regional Table 5. Percent Total Solids - 1982.

Cultivar or Selection	Alb.	Man.	Co.	Ind.	Iowa	Kan.	Kent.	La.	Mich.	Minn.	Neb. ⁺	Mo. ⁺	ND	Ohio	SD	Wisc.	Ave.
<u>Early to Medium Early</u>																	
Minn. 10504	23.0	23.0	17.7	17.1	NR	20.6	16.9	16.7	19.6	17.1	18.8	21.8	ND	17.4	16.7	19.0	
Norland	21.0	21.5	15.8	16.9	12.9	17.4	16.0	15.4	17.2	14.7	16.5	19.7	16.2	16.5	14.8	16.8	
<u>Medium to Late</u>																	
Neb. A143.70-2	21.0	22.0	16.7	15.6	14.4	18.5	16.0	ND	20.3	18.2	18.4	20.1	18.4	18.4	16.7	18.2	
Neb. A71.72-1	21.0	22.3	20.3	18.1	13.4	19.8	17.4	ND	20.3	16.9	19.0	21.6	19.9	17.2	17.1	18.9	
Neb. A63.71-1	22.0	20.8	19.9	17.1	13.7	17.9	17.4	ND	22.7	18.8	18.4	20.9	19.7	17.8	18.4	19.0	
Minn. 9569	21.0	21.8	16.5	17.0	13.2	19.4	17.0	15.6	18.0	ND	16.8	19.4	ND	17.4	15.2	19.0	
Minn. 10162	22.0	25.8	22.4	19.2	16.0	22.2	19.3	17.1	22.9	19.4	20.9	23.1	ND	19.3	19.7	20.6	
La. 42-38	23.0	24.5	19.2	19.2	14.9	20.0	18.5	17.1	23.1	17.5	20.7	22.7	20.3	19.2	18.8	19.9	
Wisc. 752	26.0	28.0	23.3	22.3	17.3	23.9	20.2	18.6	23.6	21.1	22.7	23.3	22.7	22.2	20.3	22.5	
Wisc. 806R	24.0	23.5	19.7	18.8	13.4	20.8	16.9	15.6	21.0	17.8	18.2	19.9	19.2	17.1	18.0	18.9	
ND388-1Russ	22.7	22.8	19.7	19.5	13.8	21.3	17.2	18.6	22.2	17.1	19.4	22.4	20.5	18.8	18.4	19.6	
ND534-4Russ	21.3	23.5	18.9	18.1	14.0	21.7	17.8	16.5	19.8	17.3	17.7	21.2	19.4	17.8	17.7	18.9	
ND55-7	20.0	24.0	19.7	18.4	13.7	20.4	17.5	16.7	19.6	14.7	19.2	21.8	19.7	18.9	15.4	18.7	
Red Pontiac	20.8	21.8	18.4	15.4	12.8	ND	15.8	15.4	19.0	16.5	16.5	18.6	18.0	15.5	15.2	17.1	
Norchip	22.8	23.8	20.7	19.2	15.3	22.0	19.4	17.5	20.3	16.9	20.7	22.0	20.5	18.5	18.4	19.9	
Russet Burbank	20.0	23.5	20.9	18.4	15.0	19.2	18.7	17.3	22.7	18.6	18.2	19.2	20.9	18.9	19.9	19.4	
Norgold Russet	22.0	23.0	17.5	18.8	13.2	19.2	17.3	16.5	18.8	16.7	16.9	20.5	19.4	17.4	16.9	18.3	
Average	22.0	23.2	19.2	18.2	14.9	20.3	17.6	15.5	20.7	17.4	18.8	22.5	19.6	18.1	17.5	19.1	

ND - No Data

+ - Trial was lost due to adverse weather conditions.

North Central Regional Table 6. Scab Reaction Report. Most Representative Scab (Area-Type)^{1/} - 1982.

Cultivar or Selection	Alb. Man. Co.	Ind. Iowa Kan.	Kent. La.	Mich. Minn. Neb. Mo.†	ND	Ohio SD	Wisc.
<u>Early to Medium Early</u>							
Minn. 10504	0-0	0-0	2-1	1-4	ND	2-1	0-0
Norland	0-0	1-1	1-1	3-2	0-0	1-1	0-0
<u>Medium to Late</u>							
Neb. A143.70-2	0-0	1-1	0-0	1-3	1-1	1-1	0-0
Neb. A71.72-1	1-3	1-1	1-1	1-3	ND	1-1	0-0
Neb. A63.71-1	0-0	0-0	0-0	0-0	1-2	1-1	0-0
Minn. 9569	0-0	0-0	1-1	1-3	T-1	1-1	0-0
Minn. 10162	T-2	1-1	1-5	0-0	T-1	2-1	1-2
La. 42-38	0-0	1-1	2-1	1-2	0-0	2-1	1-1
Wisc. 752	0-0	0-0	1-4	0-0	0-0	1-5	ND
Wisc. 806R	0-0	0-0	0-0	0-0	0-0	1-4	3-3
ND388-1Russ	0-0	0-0	0-0	0-0	0-0	1-1	1-1
ND534-4Russ	0-0	0-0	0-0	0-0	0-0	1-4	1-1
ND55-7	T-4	1-1	0-0	0-0	0-0	1-4	1-1
Red Pontiac	T-3	1-1	2-2	0-0	0-0	2-5	1-1
Norchip	0-0	1-1	1-1	0-0	T-3	2-1	1-1
Russet Burbank	0-0	0-0	0-0	0-0	0-0	1-1	0-0
Norgold Russet	0-0	0-0	1-1	0-0	0-0	1-1	0-0

1/ AREA	TYPE
T = less than 1%	1 - Small, superficial
1 = 1-20%	2 - Larger, superficial
2 = 21-40%	3 - Larger, rough pustules
3 = 41-60%	4 - Larger pustules, shallow holes
4 = 61-80%	5 - Very large pustules, deep holes
5 = 81-100%	

ND - No Data
+ - Trial was lost due to adverse weather conditions.

North Central Regional Table 7. Summary of Grade Defects - 1981.

Cultivar or Selection	External					Internal			
	Scab	Growth Cracks	Second Growth	Sun Green	Total Free of Ext. Defects	Hollow Heart	Internal Necrosis	Vascular Discolora- tion	Total Free of Int. Defects
<u>Early to</u>									
<u>Medium Early</u>									
Minn. 10504	2.3	1.6	1.9	1.3	92.7	0.3	0.7	12.4	87.6
Norland	6.7	4.3	4.9	2.9	78.1	2.0	0.5	8.5	89.3
<u>Medium to Late</u>									
Neb. A143.70-2	7.3	2.6	8.2	2.1	80.4	0.2	0.5	6.2	92.6
Neb. A71.72-1	6.4	1.1	4.3	3.7	84.7	2.2	2.6	11.2	83.7
Neb. A63.71-1	2.9	4.3	3.6	2.0	85.6	15.8*	0.7	9.8	74.7
Minn. 9569	3.9	2.4	10.4	1.8	81.3	1.5	0.2	10.2	88.1
Minn. 10162	15.2*	0.2	7.7	4.4	73.4	0.7	1.0	21.1*	77.4
La. 42-38	4.0	5.4*	5.1	2.8	77.8	1.8	0.1	8.9	90.0
Wisc. 752	11.7	0.5	11.3*	4.1	74.1	0.4	0.3	9.9	92.1
Wisc. 806R	3.8	1.1	5.1	1.6	82.4	0.2	1.3	9.5	89.4
ND388-1Russ	0.8	2.5	9.5	2.3	86.3	4.7*	1.5	10.6	84.7
ND534-4Russ	1.3	0.3	3.8	2.3	92.5	2.0	2.6	8.5	87.7
ND55-7	3.9	1.6	2.9	6.6	85.9	2.7	2.3	13.5	81.9
Red Pontiac	6.7	4.9	10.4	3.1	70.7	3.5	0.6	7.7	82.3
Norchip	4.1	3.5	7.0	6.5	80.5	0.5	2.3	10.4	87.5
Russet Burbank	0.5	5.3	33.0*	3.5	62.2	4.7	1.6	12.1	81.7
Norgold Russet	0.6	2.2	7.9	4.5	84.9	3.3	0.3	7.9	88.4

l/ Percent normal tubers showing no defects (some individuals had more than one type of defect)

* Possible weakness of cultivar or clone

North Central Regional Table 8. Chip Quality - 1982

Cultivar or Selection	2/ Alb.	2/ Man.	1/ Co.	3/ Ind.	3/ Iowa	3/ Kan.	2/ Kent.	1/ La.	1/ Mich.	1/ Minn.	3/ Neb.	1/ Mo.	2/ ND	2/ Ohio	2/ SD	3/ Wisc.
<u>Early to</u>																
<u>Medium Early</u>																
Minn. 10504	38.8	44	5.0	ND	ND	ND	56	3.4	2.5	ND	2.0		43	ND	ND	7.0
Norland	24.8	43	3.0	ND	ND	ND	56	2.6	3.0	ND	ND		38	59	ND	7.0
<u>Medium to Late</u>																
Neb. A143.70-2	29.6	43	7.0	ND	ND	ND	42	ND	3.5	ND	5.0		21	53	ND	8.0
Neb. A71.72-1	21.4	48	5.0	ND	ND	ND	56	ND	2.5	ND	3.0		40	66	ND	6.0
Neb. A63.71-1	38.8	41	6.0	ND	ND	ND	52	ND	3.0	ND	4.0		30	60	ND	7.0
Minn. 9569	21.9	38	4.0	ND	ND	ND	47	3.0	4.0	ND	5.0		38	ND	ND	6.5
Minn. 10162	50.0	55	3.0	ND	ND	ND	62	2.4	1.5	ND	2.0		49	ND	ND	5.5
La. 42-38	41.5	35	3.0	ND	ND	ND	48	3.3	3.5	ND	3.0		36	55	ND	7.0
Wisc. 752	23.0	48	6.0	ND	ND	ND	64	2.6	2.0	ND	2.0		42	66	ND	5.0
Wisc. 806R	28.5	39	6.0	ND	ND	ND	40	2.6	3.0	ND	3.0		33	58	ND	9.0
ND388-1Russ	17.5	41	6.0	ND	ND	ND	58	2.4	2.5	ND	3.0		35	62	ND	6.0
ND534-4Russ	45.2	36	3.0	ND	ND	ND	57	3.0	3.0	ND	6.0		31	61	ND	8.0
ND55-7	39.2	54	7.0	ND	ND	ND	65	2.2	2.0	ND	3.0		46	62	ND	5.4
Red Pontiac	18.6	31	5.0	ND	ND	ND	34	3.6	4.0	ND	6.0		22	53	ND	9.0
Norchip	51.3	53	3.0	ND	ND	ND	65	1.9	1.5	ND	2.0		49	62	ND	5.0
Russet Burbank	25.9	46	4.0	ND	ND	ND	48	3.8	3.0	ND	6.0		34	59	ND	7.0
Norgold Russet	20.4	31	3.0	ND	ND	ND	38	4.0	3.0	ND	6.0		28	45	ND	9.0
Average	31	43	5.0	ND	ND	ND	52	2.7	2.8	ND	3.8		37	59	ND	6.9

1/ PCII Color Chart (1 lightest; 10 darkest)

2/ Agron) Highest number lightest)

3/ No data reported

+ Trial was lost due to adverse weather conditions.

North Central Regional Table 9. Early Blight^{1/} - 1982.

Cultivar or Selection	Alb. Man. ^{2/}	Co. ^{2/}	Ind. ^{2/}	Iowa	Kan.	Kent. La. ^{2/}	Mich.	Minn.	Neb. ^{2/}	Mo. ⁺	ND	Ohio ^{2/}	SD ^{2/}	Wisc.	Average
<u>Early to</u>															
<u>Medium Early</u>															
Minn. 10504	5	ND	ND	ND	2.00	1	ND	2	ND	4.0	ND	ND	ND	4	3.0
Norland	5	ND	ND	ND	1.75	1	ND	ND	ND	2.0	ND	ND	ND	4	3.0
<u>Medium to Late</u>															
Neb. A143.70-2	5	ND	ND	ND	1.75	1	ND	3	ND	5.0	ND	ND	ND	4	3.3
Neb. A71.72-1	5	ND	ND	ND	2.25	1	ND	3	ND	4.5	ND	ND	ND	4	3.4
Neb. A63.71-1	5	ND	ND	ND	1.75	1	ND	3	ND	5.0	ND	ND	ND	3	3.1
Minn. 9569	5	ND	ND	ND	1.75	1	ND	ND	ND	4.0	ND	ND	ND	4	2.9
Minn. 10162	5	ND	ND	ND	2.00	1	ND	4	ND	4.8	ND	ND	ND	3	3.4
La. 42-38	5	ND	ND	ND	2.25	1	ND	2	ND	4.8	ND	ND	ND	2	3.1
Wisc. 752	5	ND	ND	ND	1.25	1	ND	2	ND	4.5	ND	ND	ND	5	3.0
Wisc. 806R	5	ND	ND	ND	1.75	1	ND	2	ND	4.5	ND	ND	ND	3	3.1
ND388-1Russ	5	ND	ND	ND	2.50	1	ND	1	ND	3.8	ND	ND	ND	5	2.8
ND534-4Russ	5	ND	ND	ND	1.75	1	ND	1	ND	3.8	ND	ND	ND	5	2.6
ND55-7	5	ND	ND	ND	2.00	1	ND	3	ND	4.0	ND	ND	ND	5	3.0
Red Pontiac	5	ND	ND	ND	ND	1	ND	2	ND	5.0	ND	ND	ND	5	3.7
Norchip	5	ND	ND	ND	1.25	1	ND	2	ND	4.0	ND	ND	ND	2	2.6
Russet Burbank	5	ND	ND	ND	1.75	1	ND	3	ND	5.0	ND	ND	ND	3	3.1
Norgold Russet	5	ND	ND	ND	1.50	1	ND	3	ND	3.8	ND	ND	ND	4	3.7
Average	5	ND	ND	ND	3.9	1.0	ND	3.8	2.4	4.3	ND	ND	ND	3.8	3.1

1/ Early Blight; 1 susceptible; 5 highly resistant

2/ No data reported (ND)

+ Trial was lost due to adverse weather conditions.

North Central Regional Table 10. Merit Ratings^{1/} - 1982

Cultivar or Selection	Alb.	Man.	Co.	Ind.	Iowa	Kan.	Kent.	La.	Mich.	Minn.	Neb.	Mo. ⁺	ND	Ohio	SD	Wisc.	Total Points
<u>Early to Medium Early</u>																	
Minn. 10504				2	ND			3			2						7
Norland	3				1				3				3	2			12
<u>Medium to Late</u>																	
Neb. A143.70-2			1						2	1							4
Neb. A71.72-1			4		5									ND			9
Neb. A63.71-1														ND			0
Minn. 9569										ND							0
Minn. 10162	4		3	3		3	2			2					1	4	19
La. 42-38						4		2			3						9
Wisc. 752	4	5	4	4	2	4	4	5			5				4	2	35
Wisc. 806R	2	2			3	5		4					1			1	23
ND388-1Russ	5		1	1		1	1		4		1		5	1	3	3	24
ND534-4Russ	2		5	4	4	1	1	1	5	4			4	5	5	5	41
ND55-7						2	3				4		2		2		13
Red Pontiac	1					ND								4			5
Norchip	1	5	3				5										14
Russet Burbank																	0
Norgold Russet	3								1					3			7

<u>1/ Merit Ratings</u>	
Rating	Points
1	5
2	4
3	3
4	2
5	1

ND - No Data
+ Trial was lost due to adverse weather conditions.

WESTERN REGIONAL POTATO VARIETY TRIAL - 1982

J.J. Pavék, D.L. Corsini, and Cooperators^{1/}

Uniform Potato Yield Trial

The 1982 Western Regional Potato Variety Trial was uniformly grown at ten locations. The trial consisted of 13 entries, 11 of which were experimental clones. The trial locations, planting, vine kill, and harvest dates, and days from planting to harvest were as follows:

State	Location	Planting Date	Vine Kill Date	Harvest Date	Days to Harvest
California	Kern Co.	2/22	6/10	7/ 7	135
"	Tulelake	5/25	8/27	9/27	125
Colorado	San Luis Valley	5/19	9/ 9	9/15	119
Idaho	Aberdeen	5/ 4	10/ 6	10/14	163
"	Kimberly	4/27	10/ 1	10/ 8	164
Oregon	Hermiston	4/ 6	9/ 3	9/28	175
"	Malheur Co.	4/26	9/30	10/ 6	163
Washington	Othello	4/ 9	-	10/ 4	178
"	Patterson	3/26	-	8/26	153
Wyoming	Torrington	5/19	9/10	9/22	126

The trial was not grown in Alberta in 1982 because of the recent Canadian quarantine against importation of seed potatoes from areas where the Columbia rootknot nematode is found.

Cultural practices and the use of fertilizer, herbicides, pesticides, and vine killing varied according to local conditions. Trial plots at all locations were irrigated on a regular schedule throughout the entire growing season according to plant needs. Temperatures across the region averaged below normal, with May and July about 3° below normal and June and August near normal. Temperature fluctuations apparently were responsible for the hollow heart incidence in some clones. Data on vine and tuber characteristics, tuber yields, specific gravities, diseases, internal quality, and merit scores are presented in Western Tables 1 through 7. Experimental clones A72685-2, A74212-1, and A74133-1 had the highest merit scores and they will be retained in the 1983 Trial. Clone A72685-2 shows potential for processing into french fries but the other two clones have had higher sugars so may be useful only for the fresh market.

Clone AC67560-1, tested in the Western Regional Potato Variety Trial during 1979-1981, was named 'Sangre' and released to growers in March 1982 by Colorado, Idaho, and the USDA.

^{1/} Alberta, D. Lynch; California, R. Voss, C. Dennett; Colorado, D. Holm; Idaho, G. Kleinschmidt, S. Michener; Oregon, A. Mosley, D. Hane, C. Stanger, G. Carter; Washington, R. Thornton, M. Martin, N. Holstad, W. Iritani; Wyoming, K. Bohnenblust.

Western Table 1. Total tuber yield, cwt/acre.

Entry	California		Colo SLV 1/	Idaho		Oregon		Washington		Wyo 1/	Overall Mean 2/
	Kern	Tul 1/		Ab	Kim 1/	Mal	Herm 1/	Oth	Pat 1/		
A72685-2	530	695	413	308	602	-	901	796	596	263	567 ab
A74212-1	600	885	418	305	551	-	999	709	671	354	610 a
A7596-1	540	675	393	273	442	-	718	725	569	210	505 b
AD74135-1	655	780	465	346	529	-	748	625	886	284	591 ab
A74133-1	705	725	355	298	496	-	735	684	539	226	529 ab
ND9474-6	445	555	189	100	243	-	332	453	693	245	362 c
BC9289-1	460	460	299	179	385	503	716	460	512	88	395 c
WnC285-18	565	410	338	147	438	419	490	549	343	114	377 c
WnC567-1	275	370	268	205	242	456	418	566	356	157	317 cd
WnC630-2	440	370	276	143	262	509	420	360	430	137	315 cd
WnC708-6	460	335	224	80	248	461	295	264	212	132	250 d
Lemhi Russet	595	750	391	269	508	623	774	571	691	217	530 ab
Russet Burbank	575	620	361	284	501	736	767	585	690	150	504 b
Location Means	527	587	338	226	419	-	639	565	553	198	450

1/ Metribuzin used for weed control.

2/ Malheur data not in calculation of overall mean or in analysis of variance, locations used as reps for Duncan's test ($P = 0.05$).

Western Table 2. US No. 1's; percent of total yield for locations; overall mean, percent and cwt/acre. 1/

Entry	California		Colo SLV	Idaho		Oregon		Washington		Wyo	Overall Mean	
	Kern	Tul		Ab	Kim	Mal	Herm	Oth	Pat		%	cwt/A
A72685-2	69	89	83	86	87	-	85	69	85	86	82	463 a
A74212-1	73	90	93	88	87	-	82	71	83	89	83	507 a
A7596-1	81	88	84	84	78	-	90	76	81	88	83	420 a
AD74135-1	56	84	81	80	81	-	66	67	84	79	75	442 a
A74133-1	97	91	83	85	79	-	93	61	80	90	84	447 a
ND9474-6	96	78	71	64	77	-	82	65	91	88	81	295 bc
BC9289-1	72	73	74	59	81	70	88	65	75	68	75	297 bc
WnC285-18	94	79	83	56	88	69	77	77	78	61	81	305 b
WnC567-1	91	80	83	78	82	56	68	62	76	77	75	239 bc
WnC630-2	92	92	88	73	91	75	82	67	83	82	84	265 bc
WnC708-6	92	84	85	31	86	73	81	73	69	83	81	202 c
Lemhi Russet	88	90	81	78	82	82	88	67	85	81	82	441 a
Russet Burbank	50	75	47	59	79	41	64	34	69	59	63	315 b
Location Means	80	85	82	75	83	-	81	66	81	82	79	357

1/ See Western Table 1 footnote 2/.

Western Table 3. U.S. No. 1's over 10 or 12 oz, percent of total yield for locations; overall mean, percent and cwt/acre.

Entry	California		Colo SLV	Idaho		Oregon		Washington		Wyo	Overall Mean $\frac{2}{\%}$ cwt/A
	Kern	Tul		Ab	Kim	Mal	Herm ^{1/}	Oth	Pat		
A72685-2	6	23	25	4	61	-	12oz	38	30	5	28 159 ab
A74212-1	13	18	46	36	66	-	11	43	42	8	31 190 a
A7596-1	19	17	36	20	59	-	12	48	40	9	31 158 ab
AD74135-1	11	10	31	33	57	-	12	42	38	8	32 166 ab
A74133-1	20	34	42	43	52	-	10	34	19	7	30 159 ab
ND9474-6	7	14	17	6	33	-	7	27	36	8	21 76 cd
BC9289-1	4	11	18	5	38	24	7	20	18	0	15 59 d
WnC285-18	22	15	28	5	47	15	9	34	26	9	26 97 cd
WnC567-1	4	19	29	20	42	28	7	26	22	4	21 67 cd
WnC630-2	30	19	31	13	51	35	9	29	37	1	28 88 cd
WnC708-6	30	18	26	0	42	43	8	55	24	11	29 72 cd
Lemhi Russet	24	14	25	23	44	43	11	31	22	4	23 121 bc
Russet Burbank	3	2	22	11	35	17	11	9	27	0	14 69 cd
Location Mean	15	17	30	23	50	-	-	34	30	6	25 114

^{1/} Average tuber weight.

^{2/} Hermiston and Malheur data not included in means or AOV for Duncan's test (P = 0.05); California over 12 oz.

Western Table 4. Specific gravity of tubers.

Entry	California		Colo SLV	Idaho		Oregon		Washington		Wyo	Overall Mean ^{1/}
	Kern	Tul		Ab	Kim	Mal	Herm	Oth	Pat		
A72685-2	1.084	1.088	1.092	1.091	1.088	-	1.087	1.080	1.084	1.091	1.087 a
A74212-1	72	83	86	80	71	-	76	78	70	78	77 cd
A7596-1	88	92	92	90	89	-	89	88	80	84	88 a
AD74135-1	78	84	88	78	81	-	77	78	77	74	79 bc
A74133-1	81	80	86	80	77	-	77	79	75	74	79 bc
ND9474-6	66	74	75	76	67	-	68	64	61	70	69 g
BC9289-1	60	80	80	74	67	87	76	68	68	76	72 efg
WnC285-18	68	77	88	72	79	99	76	68	68	75	75 de
WnC567-1	70	77	76	74	68	83	69	68	65	76	71 fg
WnC630-2	67	80	85	85	79	96	76	79	69	77	77 cd
WnC708-6	78	81	84	80	73	86	71	63	63	74	74 def
Lemhi Russet	87	96	90	84	85	94	84	76	82	80	85 a
Russet Burbank	76	86	88	77	83	89	84	82	82	75	81 b
Location Mean	1.075	1.083	1.085	1.080	1.077	-	1.078	1.075	1.073	1.077	1.078

^{1/} See Western Table 1 footnote 2/.

Western Table 5. Seed source, stand, vine characteristics, and foliar diseases.

Entry	Seed Source	Stand % (6 loc)	Vine Size (6 loc)	Maturity ^{1/} (6 loc)	Verticillium Wilt ^{2/}		Early Blight ^{2/}	
					(ID)	(Wyo)	(ID)	(Wyo)
A72685-2	Or	93	Lrg	3.7	2.2		2.8	1
A74212-1	Or	96	Lrg	3.3	1.6		3.1	1
A7596-1	Or	94	Lrg	4.0	1.3		2.5	2
AD74135-1	Or	95	Lrg	4.0	1.5		2.3	1
A74133-1	Ca	95	Lrg	4.0	1.3		2.3	1
ND9474-6	Ca	85	Sm	2.0	4.6		4.5	5
BC9289-1	Co	87	Sm	2.5	3.9		4.4	4
WnC285-18	Co	90	Med	3.2	2.6		3.6	3
WnC567-1	Co	89	Sm	2.0	4.4		4.3	2
WnC630-2	Co	85	Med	3.0	3.7		4.1	2
WnC708-6	Co	80	Sm	1.8	4.9		4.9	4
Lemhi Russet	Or	94	Lrg	2.8	2.8		4.0	3
Russet Burbank	Or	98	Lrg	3.5	3.3		3.6	2
LSD .05					0.8		0.7	

^{1/} Maturity: 1.0 (Earliest) to 5.0 (Latest)

^{2/} Wilt and blight: 1.0 (least) to 5.0 (most severe).

Western Table 6. External and internal defects, french fry color, and sugars.

Entry	U.S. No. 2 & Culls >4 oz	Common Scab (Ab)	Internal Necrosis %	Hollow heart %	Black- spot (ID)	Fry Color		Sugars % (ID)	
						OR 45°F	ID 45°F	Tot.	Red.
A72685-2	48 cd	2.4 <u>1/</u>	2	8 <u>2/</u>	3.4 <u>1/</u>	3.2	2.2 <u>3/</u>	2.3	1.2
A74212-1	61 bc	1.2	5	0	3.2	3.1	3.0	4.8	2.9
A7596-1	49 cd	0.0	6	10	4.3	1.7	2.7	2.0	1.0
AD74135-1	89 ab	0.6	1	1	3.4	2.8	2.9	3.7	2.0
A74133-1	27 cd	0.4	0	0	2.0	3.8	2.9	4.6	2.6
ND9474-6	13 d	1.3	6	15	4.4	1.2	2.2	1.9	0.9
BC9289-1	28 cd	2.2	4	5	2.8	3.1	2.2	2.7	1.5
WnC285-18	19 d	1.7	4	9	3.3	3.0	2.9	3.0	1.6
WnC567-1	27 cd	1.5	2	3	3.5	3.2	2.8	3.1	1.7
WnC630-2	14 d	0.9	2	20	2.4	3.1	1.6	2.0	0.8
WnC708-6	14 d	2.3	0	12	3.4	3.2	2.3	2.2	1.1
Lemhi Russet	32 cd	0.1	2	18	4.7	0.2	1.4	1.6	0.6
Russet Burbank	113 a	0.1	5	4	2.8	2.6	1.9	1.9	0.8
LSD .05		1.0			0.5	0.6		0.8	0.4

1/ Scab and Blackspot: 0-5, 0 (none) to 5 (maximum).

2/ Hollowheart: 6 locations summary; hollowheart in >10 or >12oz.

3/ French fry color: USDA standard chart, 0.5 (lightest) to 4.0 (darkest).

Western Table 7. Tuber type and merit rating scores. 2/

Entry	Tubers- 1/ Shape Skin		California Kern Tul		Colo SLV	Idaho Ab Kim		Oregon A B		Washington Oth Pat		Wyo	Total Merit Score
	Shape	Skin	Kern	Tul	SLV	Ab	Kim	A	B	Oth	Pat		
A72685-2	0	Rus.	.	2	3	3	4	5	4	4	3	4	31
A74212-1	L	Lt.Rus.	.	5	5	2	.	4	5	1	1	5	26
A7596-1	L-0	Rus	.	1	.	.	.	.	.	5	4	2	11
AD74135-1	L	Lt.Rus.	.	3	4	1	2	.	.	2	5	1	18
A74133-1	0-L	Lt.Rus.	4	4	1	4	1	1	1	3	.	3	22
ND9474-6	R	White	.	.	.	.	.	.	.	.	.	.	-
BC9289-1	0	Rus.	.	.	.	.	.	3	.	.	.	.	3
WnC285-18	0	Dk.Rus.	5	.	2	.	.	.	.	.	.	.	7
WnC567-1	0-L	Rus.	.	.	.	.	.	.	.	.	.	.	-
WnC630-2	0	Rus.	.	.	.	.	.	.	.	.	.	.	-
WnC780-6	0	Rus.	.	.	.	.	.	.	.	.	.	.	-
Lemhi Russet	L-0	Rus.	.	.	.	5	5	2	2	.	.	.	14
Russet Burbank	L	Rus.	.	.	.	.	3	.	3	.	2	.	7

1/ Shape: 0=oblong, L=long, R=round; Skin: Rus=russet, Lt.=light, Dk.=dark.

2/ Merit Rating: Rank Score

1	5
2	4
3	3
4	2
5	1

ALABAMA

J.L. Turner, H. Bryce, E.L. Carden, R.N. McDaniel, F.B. Selman, F.E. Garrett, M.H. Hollingsworth, J.T. Eason, M.E. Ruf and W.H. Hearn

Experimental Procedure

Seed potatoes were obtained from Frito-Lay Company (Baldwin County, Alabama); V&G Vasek, E. Grand Forks, MN; Capp Farms, Walhalla, ND; J&P Lysengen, St. Thomas, ND; Starks Farms, Rhinelander, Wisconsin; University of Wisconsin Potato Research Farm, Rhinelander, Wisconsin; and USDA, Beltsville, Maryland for the 1982 trials. Fifteen named varieties and 18 numbered selections were grown this year for yield data and specific gravity. Each entry was replicated four times in a randomized block design. One row plots were 25 feet by 38 inches at both locations. Seedpieces were cut to approximately one and one-half ounces each and treated with Orthocide 10 Dust at the rate of one pound to 100 pounds of cut seed. Seedpieces were stored above 50° F for approximately 10-12 days and planted February 23 at Fairhope and March 11 at Crossville by hand. Seedpieces were spaced 12 inches in the drill. Plots were harvested June 3 at Fairhope and July 13 at Crossville.

Results

At Fairhope, Red La Soda from Capp Farms produced the highest yield of marketable potatoes and size A potatoes. Frito-Lay 1455 was the highest yielding entry from Frito-Lay, W 807-R was the highest yielding entry from the University of Wisconsin, and B 8977-2 was the highest yielding entry from the USDA. Atlantic from both sources produced well. Frito-Lay 1360 produced the highest percent of size A potatoes. All the entries produced above 90 percent size A potatoes except B 8972-1, Bel Rus, and W 795. Russet Sebago, Superior, and FL 1280 were the lowest yielding entries. Atlantic from the USDA produced the highest specific gravity of all entries. In general, however, all entries produced somewhat low solids this year. Plant stand counts were variable and ranged from a high of 96 percent for W 797 to a low of 58 percent for FL 1280. Three entries from the USDA were russet, B 8977-2, B 8943-4, and B 8972-1. Bel Rus, also russet, was rated highest for eye appeal of the russet skin entries. Atlantic was rated highest for eye appeal for the non-russet white skin entries. Red La Soda and W 806-R were equal for eye appeal for the red skin entries.

At Crossville, FL 1455, 1291, and 657 were the highest yielding entries. Red La Soda, from two sources, was the highest yielding red skin variety. Inadequate amounts of rainfall and distribution during the growing season reduced yields for all entries. Size B production was considerably higher for Crossville than for Fairhope. Frito-Lay 1455 and 1360 produced the highest percent of size A potatoes. Wisconsin 760 produced the highest specific gravity, 1.074. All entries produced only fair to poor solids. Frito-Lay 1455 and 1291 had the highest percent plant stands at harvest and W 716 had the lowest.

Alabama Table 1. Potato Variety Trial, Fairhope, 19821/

Variety	Source	Marketable yield/acre				Size A of total	Specific gravity ^{3/}	Stand at harvest
		Total	Size A ^{2/}	Size B				
		Cwt.	Cwt.	Cwt.	%			%
Red La Soda	Capp Farms, Walhalla, ND	270	257	13	95	1.058		75
FL 1455	Frito-Lay	260	253	7	97	.076		93
FL 1291	Frito-Lay	254	239	15	94	.065		89
FL 1152	Frito-Lay	251	236	15	94	.060		91
W 807-R	U. Wisconsin	247	235	12	95	.059		84
B 8977-2	USDA	238	226	12	95	.064		92
W 760	U. Wisconsin	233	222	11	95	.077		77
W 797	U. Wisconsin	232	220	12	95	.065		96
FL 1360	Frito-Lay	229	224	5	98	.067		76
W 742	U. Wisconsin	219	210	9	96	.077		90
FL 657	Frito-Lay	215	207	8	96	.061		86
Atlantic	Starks Farms	214	205	9	96	.072		85
FL 1221	Frito-Lay	207	194	13	94	.062		84
W 738	U. Wisconsin	205	198	7	97	.069		82
Atlantic	USDA	203	193	10	95	.079		79
B 8724-2	USDA	201	184	17	92	.070		82
Red La Soda	J&P Lysengen, St. Thomas, ND	195	182	13	93	.058		92
B 8615-2	USDA	195	178	17	91	.075		91
FL 795	Frito-Lay	195	190	5	97	.071		77
B 9127-6	USDA	193	185	8	96	.059		88
W 716	U. Wisconsin	192	180	12	94	.061		79
FL 162	Frito-Lay	185	175	10	95	.064		89
W 723	U. Wisconsin	183	172	11	94	.063		92
Belchip	USDA	183	174	9	95	.062		81
Chipbelle	USDA	181	166	15	92	.077		89
W 806-R	U. Wisconsin	179	161	18	90	.063		79
Belchip	Starks Farms	171	163	8	95	.066		70
B 8943-4	USDA	163	149	14	91	.068		93
Norchip	A&G Vasek, E. Grand Forks, MN	161	152	9	94	.066		78

Alabama Table 1. Continued

Variety	Source	Marketable yield/acre			Size A of total	Specific ^{3/} gravity	Stand at harvest
		Total	Size A ^{2/}	Size B			
		Cwt.	Cwt.	Cwt.			
B 8798-20	USDA	160	151	9	94	.070	88
B 8710-16	USDA	139	133	6	95	.062	82
B 8972-1	USDA	138	117	21	85	.071	77
W 826	U. Wisconsin	137	125	12	91	.072	95
Bel Rus	Starks Farms	133	118	15	89	.076	93
W 795	U. Wisconsin	124	110	14	89	.072	94
Russet Sebago ..	Starks Farms	119	110	9	92	.058	72
Superior	Starks Farms	115	105	10	91	.069	72
FL 1280	Frito-Lay	113	104	9	92	.060	58

1/ Soil test: P = 100 (M); K = 110; pH = 6.1.

2/ Size A = potatoes with 1-7/8 inches diameter and larger, Size B = potatoes with 1-1/2 to 1-7/8 inches diameter.

3/ Specific gravity was greater than 1.0 for each variety.

4/ Rainfall data for growing season (inches): February, 9.58; March, 7.84; April, 2.90; May, 1.64; June 1-3, 1.15.

5/ Mean soil temperatures for growing season (F): February, high 62, low 52; March, high 76, low 57; April, high 79, low 67; May, high 90, low 74; June 1-3, high 92, low 78.

Alabama Table 2. Potato Variety Trial, Crossville, 1982^{1/}

Variety	Source	Marketable yield/acre			Size A of total	Specific ^{3/} gravity	Stand at harvest
		Total	Size A ^{2/}	Size B			
		Cwt.	Cwt.	Cwt.	%		%
FL 1455	Frito-Lay	205	193	12	94	1.073	98
FL 1291	Frito-Lay	198	180	18	91	.059	98
FL 657	Frito-Lay	195	182	13	93	.053	97
W 760	U. Wisconsin	186	158	28	85	.074	96
Red La Soda	J&P Lysengen, St. Thomas, ND	184	149	35	81	.051	94
FL 795	Frito-Lay	175	158	17	90	.064	88
Red La Soda	Capp Farms, Walhalla, ND	174	147	27	84	.054	95
W 723	U. Wisconsin	148	121	27	82	.059	90
La Chipper		146	123	23	84	.058	82
Belchip	Starks Farms	142	121	21	85	.055	93
Atlantic	Starks Farms	140	107	33	76	.067	81
FL 1360	Frito-Lay	140	132	8	94	.069	72
W 795	U. Wisconsin	132	96	36	73	.061	69
FL 162	Frito-Lay	130	110	20	85	.056	84
FL 1152	Frito-Lay	129	117	12	91	.051	84
FL 1221	Frito-Lay	128	107	21	84	.058	85
W 742	U. Wisconsin	127	97	30	76	.067	96
Norchip	A&G Vasek, E. Grand Forks, MN	123	100	33	81	.063	89
W 806-R	U. Wisconsin	119	87	32	73	.051	81
Kennebec		119	105	14	88	.053	83
W 738	U. Wisconsin	108	91	17	84	.053	86
W 826	U. Wisconsin	103	70	33	68	.070	82
Superior	Starks Farms	101	79	22	78	.059	79
W 797	U. Wisconsin	97	65	32	67	.053	85
W 807-R	U. Wisconsin	83	60	23	72	.050	79
FL 1280	Frito-Lay	78	62	16	79	.050	70
Russet Sebago ..	Starks Farms	76	62	14	82	.050	81
W 716	U. Wisconsin	68	50	18	74	.055	64
Bel Rus	Starks Farms	40	20	20	50		76

^{1/} Soil test: P = 230 (VH); K = 180 (H); pH = 5.5.

^{2/} Size A = potatoes with 1-7/8 inches diameter and larger; Size B = potatoes with 1-1/2 to 1-7/8 inches diameter.

^{3/} Specific gravity was greater than 1.0 for each variety.

^{4/} Rainfall for growing season (inches): March, 2.94; April, 9.26; May, 2.13; June, 3.85; July 1-13, 1.10.

^{5/} Mean soil temperatures for growing season (F): March, high 58, low 45; April, high 63, low 52; May, high, 81, low 65; June, high 86, low 71; July 1-13, high 90, low 76.

Alabama Table 3. Characteristics of Potato Varieties, Fairhope, 1982^{1/}

Variety	Source	Shape	Skin ^{2/} color	Eye ^{3/} size	Eye ^{4/} depth	Eye ^{5/} appeal
Red La Soda	Capp Farms, Walhalla, ND	Round	Red	L	M	4.5
FL 1455	Frito-Lay	R-flat	Wh	S	S	3.5
FL 1291	Frito-Lay	Round	Wh	S	S	3.0
FL 1152	Frito-Lay	Round	Wh	M	M	3.0
W 807-R	U. Wisconsin	Round	Red	S	S	2.5
B 8977-2	USDA	Long	Russet	S	S	3.0
W 760	U. Wisconsin	Round	Wh	S	S	3.0
W 797	U. Wisconsin	R-long	Wh/SR	S	S	3.5
FL 1360	Frito-Lay	R-flat	Wh	M	M	3.5
W 742	U. Wisconsin	R-flat	Wh/SR	S	S	3.0
FL 657	Frito-Lay	Round	Wh	S	S	3.0
Atlantic	Starks Farms	Round	Wh/SR	M	M	5
FL 1221	Frito-Lay	R-flat	Wh	S	S	3.5
W 738	U. Wisconsin	Round	Wh	S	S	5
Atlantic	USDA	Round	Wh/SR	S	S	3.5
B 8724-2	USDA	Round	Wh/SR	S	S	3.5
Red La Soda	J&P Lysengen, St. Thomas, ND	R-long	Wh/SR	S	S	3.5
B 8615-2	USDA	Round	Red	L	M	4.5
FL 795	Frito-Lay	Round	Wh	S	S	4.0
B 9127-6	USDA	Round	Wh	M	M	3.5
W 716	U. Wisconsin	Round	Wh/SR	S	S	3.5
FL 162	Frito-Lay	Round	Wh/SR	S	S	3.5
W 723	U. Wisconsin	Round	Wh	S	S	3.5
Belchip	USDA	R-long	Wh	M	M	3.0
Chipbelle	USDA	R-flat	Wh	M	M	3.5
W 806-R	U. Wisconsin	R-long	Wh	S	S	3.5
Belchip	Starks Farms	Round	Red	S	S	4.5
B 8943-4	USDA	R-flat	Wh	M	M	3.5
Norchip	A&G Vasek, E. Grand Forks, MN	Round	Russet	S	S	4.0
		Round	Wh	S	S	3.5

Alabama Table 3. Continued

Variety	Source	Shape	Skin ^{2/} color	Eye ^{3/} size	Eye ^{4/} depth	Eye ^{5/} appeal
B 8798-20	USDA	Round	Wh	M	D	3.0
B 8710-16	USDA	Round	Wh	S	S	3.5
B 8972-1	USDA	Long	Russet	S	S	3.5
W 826	U. Wisconsin					
Bel Rus	Starks Farms	Long	Russet	S	S	5
W 795	U. Wisconsin	Round	Wh	S	S	3.5
Russet Sebago ..	Starks Farms	Round	Wh	S	S	3.0
Superior	Starks Farms	Round	Wh	S	S	3.0
FL 1280	Frito-Lay	R-flat	Wh	S	S	3.0

1/ Soil test: P = 100 (M); K = 110 (H); pH = 6.1.

2/ Wh = white; SR = some russet.

3/ S = small; M = medium; L = large.

4/ S = shallow; M = medium; D = deep.

5/ 5 = excellent; 4 = good; 3 = poor; 2 = fair; 1 = very poor.

6/ Rainfall data for growing season (inches): February, 9.58; March, 7.84; April, 2.90; May, 1.64; June 1-3, 1.15.

7/ Mean soil temperatures for growing season (F): February, high 62, low 52; March, high 76, low 57; April, high 79, low 67; May, high 90, low 74; June 1-3, high 92, low 78.

COLORADO

D. G. Holm and M. Workman

Twenty-two parental clones were selected for crossing in 1982. Seeds from 189 combinations were obtained. Sixty-five seedling families were grown in the greenhouse, producing approximately 11,000 tubers for initial selection in 1983. Surplus tubers were distributed to Idaho, Oregon, and Minnesota.

Seedling tubers were obtained from Dr. R. E. Webb, Beltsville, Maryland, and Dr. J. J. Pavsek, Aberdeen, Idaho. A total of 28,800 first-year seedlings were planted with 398 being selected for further observation in 1983.

Another 292 clones were in various stages of preliminary testing. Forty-six of these clones were selected for continued evaluation. Eighteen advanced seedlings are being increased and evaluated. Two processing lines, WC672-2 and WC521-12, continue to show potential and are being tested in large scale out-state trials. Seed of WC672-2 was released to foundation growers. A russet selection, BC9289-1, shows fresh market potential.

Five clones were tested for chip color at harvest and after various storage regimes. Included were TC711-1, WC521-12, WC672-2, Atlantic, and Norchip. None of these clones produced acceptable chips in 1982. This may be attributed to a very cool growing season, with excessive moisture in August through mid-September.

FLORIDA

J. R. Shumaker, D. P. Weingartner, J. Watts, and R. E. Webb

Variety and Seedling Trials

Methods. Potato varieties and seedlings were tested for their adaptability and desirable horticultural characteristics at the Agricultural Research Center, Hastings, Florida. Clones were grown in either advanced (four replications), intermediate (two replications) or single plot observational trials. Telone® (6 gpa preplant) and Temik® (3 lb ai/A in-the-row at planting) were applied to all trials. Seed was spaced 12 inches apart in 20 foot single row plots. Between row spacing was 40 inches. The crop was planted on January 26 and February 3 and harvested May 17-19. Commercial cultural practices were used in all tests. Yield of tubers, their appearance and specific gravity were taken at harvest. Tuber samples were shipped to Berwick, Pennsylvania, for chip color evaluation. The tests were grown under generally favorable conditions.

Round White Adaptability and Processing Quality Trials. In advanced trials (Table 1) Atlantic, standard chip cultivar, was superior to 23 other white clones in combining high tuber and chip color. Several clones tested in intermediate trials (Table 2) did however, demonstrate good processing and/or fresh market traits. USDA seedlings B9423-4, B8710-16, B8706-10, B9344-5, B9336-27, B9340-13, and B8702-18 were considered the most promising. They will be further evaluated in replicated trials during 1983.

Long Russet Adaptability Trials. Three clones, B9538-6, B9540-62 and B9539-7, which were statistically superior to 'Centennial Russet' (oblong to round tuber types) in tuber yield production also produced highly desirable tubers equal to the long 'BelRus' type (Table 4). In intermediate trials (Table 5) B9523-10, B9648-9, B9545-25 and B9540-14 combined a uniform long russet tuber type with high yields. They will be advance tested in 1983.

Florida Table 1. Results from 24 clones selected for advanced testing at Hastings, Florida -- 1982.

Clone	Yield (cwt/acre)		Tuber appear- ance ^{1/}	Specific gravity	Chip Color ^{2/} Weeks after harvest					Average
	US#1A	Total			1	2	3	4	5	
Crystal	307	375	5.2	1.065	4	3	5	5	6	4.6
B8724-2	299	343	6.0	1.068	5	6	4	5	5	5.0
Atlantic	293	324	6.5	1.074	3	3	3	3	2	2.8
S9226	289	312	5.0	1.072	5	3	4	4	5	4.2
La Chipper	285	305	6.7	1.067	3	3	4	3	2	3.0
B9127-6	284	297	5.5	1.063	4	3	3	3	2	3.0
Sebago	276	323	6.7	1.057	3	4	4	4	4	3.8
B9507-11	269	311	8.0	1.063	2	3	3	2	4	2.8
B9224-6	263	297	6.2	1.066	2	2	4	3	3	2.8
Belchip	246	269	4.2	1.069	2	2	3	1	3	2.2
Oceania	244	268	8.2	1.060	3	3	5	4	3	3.6
B9507-12	239	276	7.0	1.069	3	5	4	3	3	3.6
B9140-32	235	255	7.0	1.077	2	2	4	3	5	3.2
B8798-20	230	260	6.7	1.075	2	2	3	2	4	2.6
B9140-4	227	267	5.7	1.069	2	2	3	2	3	2.4
B8799-13	227	250	7.2	1.077	3	2	4	5	5	3.8
B9536-8	213	240	8.0	1.067	4	3	3	4	3	3.4
New Oneida	212	256	7.2	1.075	4	3	4	3	4	3.6
Late Superior	212	246	6.0	1.068	3	4	3	5	3	3.6
B9311-7	204	246	6.0	1.072	3	3	3	3	3	3.0
B8091-8	195	240	6.7	1.066	2	2	3	2	2	2.2
B8943-4	192	225	5.0	1.068						
Superior	189	227	6.0	1.066	2	3	4	2	3	2.8
B6987-184	147	174	5.5	1.074	2	2	4	2	3	2.6
LSD (0.05)	38	36	1.0	0.004						
(0.01)	51	48	1.4	0.005						

1/ From 9.0 = most desirable to 0.0 = completely undesirable.

2/ Chip color: 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use.

Florida Table 2. Results from 24 clones selected for intermediate testing at Hastings, Florida -- 1982.

Clone	Yield (cwt/acre)		Tuber appear- ance ^{1/}	Specific gravity	Chip Color ^{2/} Weeks after harvest					Average
	US#1A	Total			1	2	3	4	5	
B9423-4	393	416	5.5	1.067	3	2	4	2	3	2.8
B8710-16	359	388	8.0	1.071	4	5	5	5	-	4.7
B9468-1	325	357	4.0	1.068	6	6	6	6	6	6.0
B8706-10	322	344	8.0	1.077	2	2	3	2	2	2.2
B9384-4	318	348	5.5	1.066	2	3	4	2	2	2.6
B9344-5	297	316	7.0	1.075	2	2	3	3	2	2.4
B9336-27	287	318	6.5	1.086	2	3	4	5	3	3.6
Atlantic	286	341	6.5	1.075	4	3	4	5	4	4.0
B9340-13	282	309	7.5	1.080	3	4	5	5	4	4.2
B8706-7	280	312	6.5	1.077	2	1	4	4	2	2.6
B8702-18	273	306	7.0	1.073	1	1	3	2	2	1.8
B8706-14	254	277	7.5	1.077	1	1	3	3	2	2.0
B9510-5	244	282	6.0	1.071	2	2	3	2	3	2.4
B9514-38	235	267	6.5	1.075	2	2	3	3	2	2.4
B9335-35	224	237	7.0	1.085	2	1	4	2	4	2.6
B9409-1	223	308	4.0							
B9510-19	222	267	6.5	1.073	2	4	4	5	3	3.6
Superior	211	257	7.0	1.071	4	3	4	4	5	4.0
B9511-5	210	242	8.0	1.071	3	1	3	2	4	2.6
B9572-5	199	233	6.0	1.078	2	4	4	5	5	4.0
B8599-42	187	209	7.5	1.076	2	4	5	5	3	3.8
B9514-46	169	193	6.5	1.076	2	2	3	3	3	2.6
B8799-8	158	180	8.5	1.073	4	3	4	2	3	3.2
B9510-17	81	136	6.0							

1/ From 9.0 = most desirable to 0.0 = completely undesirable.

2/ Chip color: 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use.

Florida Table 3. Results from 62 clones selected for observational testing at Hastings, Florida -- 1982.

Clone	Yield (cwt/acre)		Tuber appear- ance ^{1/}	Specific gravity	Chip Color ^{2/} Weeks after harvest					Average
	US#1A	Total			1	2	3	4	5	
B8687-20	355	393	8.0	1.076	5	6	6	6	6	5.8
B9792-9	355	368	6.0	1.074	1	1	3	1	2	1.6
B8684-17	344	367	4.0							
B9786-14	343	371	4.0							
B9791-1	339	386	4.0							
B9792-16	331	362	5.0	1.075	1	1	3	2	2	1.8
Sebago	327	360	7.0	1.060	5	2	5	4	5	4.2
B8687-14	314	374	7.0	1.083	6	6	8	6	4	6.0
B9786-20	311	344	8.0	1.069	2	2	4	3	3	2.8
B9786-15	306	332	7.0	1.068	3	3	4	4	3	3.4
B9792-45	301	344	-	1.081	2	3	3	2	2	2.4
B8687-8	296	324	8.0	1.075	3	4	4	3	3	3.4
B9696-1	294	329	4.0							
B8687-10	293	322	8.0	1.073	6	8	7	6	6	6.6
B9792-6	290	315	6.0	1.075	2	1	3	1	2	1.8
Atlantic	286	320	6.8	1.085	3	5	5	3	3	3.8
B9786-6	276	316	7.0	1.067	5	2	5	4	3	3.8
B9792-8	273	297	3.0							
B9792-4	268	281	4.0							
B9792-49	267	278	8.0	1.067	2	3	3	5	3	3.2
B8683-1	263	296	6.0							
B9789-2	262	304	5.0							
B9792-21	261	282	6.0	1.068	2	2	3	1	3	2.2
B9792-41	260	278	4.0							
B8687-12	257	295	8.0							
B9792-23	256	285	7.0	1.066	2	5	4	2	2	3.0
B9792-14	254	269	8.0	1.064	2	2	3	2	3	2.4
B9686-5	253	284	5.0							
B9792-2	252	276	7.0	1.070	1	3	5	5	2	3.2
B9786-7	251	294	7.0							
B9792-28	246	277	4.0							
B9690-6	245	293	4.0							
B9792-20	242	269	6.0	1.071	2	1	4	2	2	2.2
B9792-43	236	269	6.0	1.088	2	2	3	3	2	2.4
B9792-17	233	278	5.0							
Superior	233	265	7.2							
B9792-10	227	256	6.0	1.069	2	4	3	2	2	2.6
B9792-22	220	284	5.0							
B9792-11	220	265	5.0							
B9792-13	214	240	5.0							
B9677-6	212	259	7.0							
B8687-13	206	231	8.0	1.067	5	5	6	5	5	5.2
B9792-44	205	246	6.0							
B9792-7	204	235	4.0							
B9787-3	203	237	7.0	1.078	6	6	6	6	6	6.0
B8687-7	201	224	8.0	1.067	2	3	4	3	4	2.2
B8687-23	197	276	6.0	1.074	3	4	6	5	3	4.2

Florida Table 3. (Continued)

Clone	Yield (cwt/acre)		Tuber appear- ance ^{1/}	Specific gravity	Chip Color ^{2/} Weeks after harvest					Average
	US#1A	Total			1	2	3	4	5	
B8687-11	182	231	5.0							
B9792-38	180	207	5.0							
B9792-39	180	196	4.0							
B9792-1	174	187	4.0							
B9792-47	170	218	6.0							
B8687-3	165	209	7.0							
B8687-31	151	182	7.0							
B8682-7	137	170	4.0							
B8684-16	131	186	5.0							
B8687-16	127	218	5.0							
B8687-5	125	176	7.0							
B8687-2	116	196	7.0							
B8682-4	95	131	7.0							
B9792-34	95	119	5.0							
B8687-19	67	109	5.0							

1/ From 9.0 = most desirable to 0.0 = completely undesirable.

2/ Chip color: 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use.

Florida Table 4. Results from 24 russet skin clones selected for advanced testings at Hastings, Florida -- 1982.

Clone	Yield (cwt/acre)		Tuber appear- ance ^{1/}	Specific gravity
	US#1A	Total		
Norgold 10-7	310	367	5.0	1.059
B8833-6	307	352	4.7	1.053
B8934-4	300	358	5.2	1.057
B9553-6	279	333	4.7	1.057
B9538-6	274	305	7.0	1.066
B9540-2	271	337	5.7	1.059
B9540-62	267	299	8.2	1.059
B9539-7	246	332	7.2	1.056
B9540-5	240	320	4.5	1.068
B9539-18	236	332	6.0	1.065
B9137-9	236	317	5.0	1.058
Russet Burbank	235	325	3.7	1.073
Norgold 19	225	300	4.7	1.064
B9539-6	224	303	3.7	1.055
Russette	224	294	6.5	1.064
B9648-15	186	264	5.7	1.057
Centennial	184	267	6.2	1.055
BelRus 12	175	216	6.7	1.076
B8972-1	161	230	8.0	1.069
B9540-16	159	228	5.7	1.068
BelRus	158	223	8.0	1.071
BelRus 4	155	193	7.2	1.075
B9540-29	152	222	4.7	1.066
B8686-8	139	205	5.5	1.084
LSD (0.05)	57	54	1.4	0.004
(0.01)	77	72	1.9	0.006

1/ From 9.0 = most desirable to 0.0 = completely undesirable.

Florida Table 5. Results from 19 russet clones selected for intermediate testings at Hastings, Florida -- 1982

Clone	Yield (cwt/acre)		Tuber appear- ance ^{1/}
	US#1A	Total	
B9539-14	268	341	5.5
B9523-10	259	292	7.5
B9648-9	252	339	6.0
B9545-25	244	315	7.0
10-7	235	309	5.0
Norgold 40	207	307	4.0
B9540-14	192	232	7.5
Centennial	188	253	7.3
B9400-5	182	211	6.0
B9407-1	177	203	7.0
B9606-9	165	184	7.0
7003-2	163	235	6.0
B9540-55	161	252	6.0
B9398-2	158	216	6.0
B9540-62	153	209	7.7
B8972-1	139	219	8.0
B9395-25	137	163	6.5
BelRus	90	178	8.0
B9434-11	47	137	6.5

1/ From 9.0 = most desirable to 0.0 = completely undesirable.

Florida Table 6. Results from 75 russet skin clones selected for observational testing at Hastings, Florida -- 1982

Clone	Yield (cwt/acre)		Tuber appear- ance ¹ /
	US#1A	Total	
B9720-7	256	378	3.0
B9755-6	251	297	8.0
B9711-1	250	274	8.0
B9720-3	237	281	7.0
B9724-16	231	342	4.0
B9714-1	229	273	7.0
B9760-3	227	285	6.0
B9717-14	210	238	7.0
B9735-1	208	298	7.0
B9752-4	202	314	5.0
B9752-7	201	248	6.0
B9729-2	197	259	10.0
B9724-17	193	276	5.0
B9714-6	193	241	5.0
B9742-12	189	295	3.0
B9752-3	189	256	7.0
Centennial	187	247	6.8
B9717-4	184	248	8.0
B9718-2	181	263	5.0
B9740-10	179	203	6.0
B9765-3	178	265	7.0
B9742-5	178	212	5.0
B9727-1	175	236	8.0
B9715-1	174	224	7.0
B9716-1	173	310	4.0
B9714-2	171	245	4.0
B9715-2	158	295	2.0
B9709-2	157	242	7.0
B9738-5	156	187	7.0
B9765-9	155	208	6.0
B9718-5	153	189	7.0
B9728-4	151	216	6.0
B9733-2	150	229	4.0
B9718-6	141	198	6.0
B9740-8	141	189	8.0
B9762-9	139	225	7.0
B9765-6	139	201	6.0
B9716-2	138	187	6.0
B9762-3	137	185	5.0
B9742-7	129	199	7.0
B9756-1	128	218	5.0
B9735-8	126	204	3.0
B9872-11	124	172	5.0

Florida Table 6. (Continued)

Clone	Yield (cwt/acre)		Tuber appear- ance ^{1/}
	US#1A	Total	
B9762-5	122	210	7.0
B9713-1	121	197	4.0
B9703-4	119	169	8.0
B9713-6	117	241	4.0
BelRus	112	182	8.0
B9744-1	110	180	7.0
B9762-4	109	154	6.0
B9724-13	108	181	7.0
B9742-1	105	168	6.0
B9718-7	99	184	6.0
B9736-3	98	227	6.0
B9767-20	96	156	7.0
B9738-3	93	157	5.0
B8972-1	91	157	6.8
B9742-14	90	189	4.0
B9716-3	90	158	5.0
B9742-15	90	133	6.0
B9762-1	90	127	7.0
B9738-2	88	169	4.0
B9745-6	82	171	6.0
B9718-13	70	210	3.0
B9734-3	65	169	5.0
B9740-1	65	162	6.0
B9728-2	64	171	6.0
B9735-6	60	182	2.0
B9768-2	37	88	6.0
B9720-8	31	141	5.0
B9745-4	31	76	5.0
B9719-4	28	84	4.0
B9735-2	27	125	4.0
B9723-3	14	144	3.0

1/ From 9.0 = most desirable to 0.0 = completely undesirable.

Florida Table 7. Results from 4 red clones selected for advanced testing at Hastings, Florida -- 1982.

Clone	Yield (cwt/acre)		Tuber appear- ance ^{1/}	Specific gravity
	US#1A	Total		
Red La Soda	261	278	5.7	1.061
Dark Red Norland-13	247	279	8.2	1.058
Red Viking Sport	231	247	6.5	1.070
A-143.70-2	214	235	7.2	1.073
LSD (0.05)	25	27	1.2	0.003
(0.01)	36	39	1.7	0.005

1/ From 9.0 = most desirable to 0.0 = completely undesirable.

J. J. Pavék, D. L. Corsini, C. Stanger, and S. Michener

Germplasm and
Variety Development

Crossing and early generations (Aberdeen). This work continued at about the same level as in the previous two years. Eighty-seven 4X clones, including 21 named varieties, were crossed in 756 combinations; 157 of these involved S. andigena or S. vernei resistance to the golden nematode. Thirty diploid russets and non-russets were used in 205 crosses. Accessions of S. microdontum, tarijense, and fendleri, apparently resistant to Verticillium wilt, were crossed with cultivated diploids in 14 combinations. Seedlings from about 1/3 of all these crosses will be grown out in 1983. About 70,000 single-hills and 2200 12-hill plots were grown and selected. One hundred fifty-two clones, about 80% oblong to long russets-- the rest chippers and reds, were grown in preliminary and intermediate yield and disease trials. After quality and storage evaluations, 57 were selected for further testing. Fifty-five clones, selected from the third field generation, were established for seed multiplication at the Tetonia Station using tuber indexing and stem cutting.

Advanced yield trials. Data from the late harvest trial, grown at Aberdeen and Kimberly, Idaho and at Malheur Station, Oregon are presented in ID-OR Table 1. Moisture stress lowered the percentage of U.S. No. 1's at Malheur Station and fertility problems and severe early blight at Aberdeen reduced the yield. The top performing clone over the three locations, A76147-2, has oblong, non-russeted tubers and internal quality satisfactory for processing. Long russets A75188-3 and A7411-2 show promise and will be tested further.

The early harvest trial, results shown in ID-OR Table 2, was grown at Malheur Station and at Aberdeen. Again, A76147-2 was the top performing clone. In addition, A74114-4 looked good at Aberdeen and will be tested again in 1983.

Descriptive information and certain disease reactions for the entries in these advanced yield trials are presented in Table ID-OR Table 3. The vine size and maturity values are higher for the early harvest checks than for the late harvest checks because of higher fertility in the early harvest trial field. The wide range in values for the various disease reactions indicates that considerable progress can be made through breeding and selection for resistance to these diseases. The scores show that high yielding clone A76147-2 has good resistance to these major diseases.

Other Studies. Twenty-five clones replicated and 106 hills not replicated were screened for resistance to rootknot nematode near Parma, Idaho by cooperators Drs. R. R. Romanko and Saad Hafez. The reactions ranged from moderately resistant (BelRus) to very susceptible (Russet Burbank).

Distribution. The distribution of breeding selections, named varieties, seedling tubers, and true seed during 1982 is summarized in ID-OR Table 4.

ID-OR Table 1. 1982 Advanced Late Harvest Yield Trial, tuber yields, specific gravity, and french fry color.

Entry	Kimberly, Idaho				Aberdeen, Idaho				Malheur Co. Oregon						
	Total Yield cwt/A	US No. 1		Spec. Grav.	Fry Color	Total Yield cwt/A	US No. 1		Spec. Grav.	Fry Color	Total Yield cwt/A	US No. 1		Spec. Grav.	Fry Color
		Tot	> 10oz %				Tot	> 10oz %				Tot	> 10oz %		
A76147-2	617	88	72	1.082	1.8	366	94	64	1.083	1.6	932	67	45	1.091	1.0
Lemhi Rus.	597	82	53	86	2.0	364	86	31	87	1.3	623	82	43	94	0.8
A75188-3	552	81	64	73	2.6	333	83	55	80	2.3	760	86	62	91	2.5
A74341-4	551	83	53	77	2.1	264	79	20	77	1.1	691	74	35	86	0.5
A74595-11	543	79	56	85	1.9	278	77	32	92	1.0	476	72	39	97	0.7
Russet B.	541	78	34	85	1.3	254	60	14	77	1.7	736	41	17	89	1.3
A7411-2	488	83	57	90	1.8	318	88	52	91	1.1	788	66	42	102	0.9
Butte	480	84	46	87	2.6	276	68	15	80	2.3	647	65	32	101	1.2
A7637-8	424	89	52	84	1.3	259	76	25	75	1.1	556	84	52	96	0.7
78-LC1	374	85	38	72	2.4	170	58	4	77	2.4	-	-	-	-	-
A7637-12	328	82	45	90	2.7	159	66	10	86	2.6	514	75	32	103	1.4
LSD.05	110			.005	0.6	51			.004	0.5	103			.005	0.5

Specific Gravity: air and water weight method.

French Fry Color: 0.5 (lightest) to 4.0(darkest), after 3 months' storage at 45° F.

	Planting Date	Vine Kill	Harvest Date	Days to Harvest
Kimberly	4/27	10/1	10/8	157
Aberdeen	5/4	10/6	10/14	155
Malheur Co.	4/26	9/30	10/6	157

ID-OR Table 2. Advanced Early Harvest Yield Trial, tuber yields, specific gravity, and french fry color.

Entry	Malheur Co. Oregon						Aberdeen, Idaho			
	US No. 1			Hollow Heart			US No. 1		Spec. Grav.	
	Total Yield cwt/a	Tot %	>10oz %	Spec. Grav.	Heart %	Fry Color	Total Yield cwt/A	Tot %	>10oz %	Fry Color
A76147-2	547	82	34	1.082	0	0.7	472	89	49	1.084
NDA8694-3	432	79	28	78	0	0.5	316	80	13	73
Norgold M	403	68	22	76	16	1.9	342	80	23	72
Russet Burbank	382	54	8	76	4	0.5	355	55	4	82
A76161-4	376	66	19	75	0	1.0	310	83	29	76
Norgold Russet	363	71	24	78	23	1.5	273	72	11	75
A74114-4	349	67	25	81	13	0.7	361	80	21	83
Lemhi Russet	338	77	16	84	5	0.6	399	80	17	87
Norgold 35	313	68	24	74	16	1.8	304	70	16	73
A68678-9	227	79	34	70	0	1.2	365	80	21	80
LSD .05	80			.003		0.5	59			.004

Specific Gravity: Air and water weight method.

French fry color: 0.5(lightest) to 4.0(darkest), fried within 7 days of harvest.

Hollow heart in > 10oz tubers.

	Planting Date	Vines Removed	Harvest Date	Days to Harvest
Malheur Co.	4/26	8/6	8/12	108
Aberdeen	4/29	8/16	8/18	111

ID-OR Table 3. Advanced selections, vine and tuber characteristics and disease reactions. Aberdeen.

	Tuber 1/		Vines 2/			Tubers 3/					
	Shape	Rus.	Size	Mat.	Vert. wilt	Early Bl.	Scab	E. bl. Rot	Net Nec.	F. samb. Index	F. coer. Index
Late Harvest											
A7411-2	L	M	5	6	1	3	5.0	1.4	1.5	1.2	3.0
A74341-4	0-L	M.Hv	6	6	2	4	0.1	1.1	2.0	1.9	1.1
A74595-11	0-L	M.Hv	5	5	1	5	0.0	1.2	1.3	1.5	2.3
A75188-3	0	M	6	6	1	3	0.3	1.2	1.4	4.4	1.0
A7637-8	0	M+	6	6	1	4	1.5	1.0	1.2	4.6	4.9
A7637-12	0-L	M.Hv	7	6	2	3	3.2	0.7	2.1	4.4	2.5
A76147-2	0-L	Non	5	5	1	4	2.1	0.7	2.5	1.5	2.4
78-LC1	0-L	M-	1	1	9	9	0.1	3.4	1.2	1.1	1.9
Butte	L-0	M	6	5	4	6	0.6	1.3	1.8	2.3	1.7
Lemhi Rus.	L-0	M+	5	4	3	5	0.2	0.8	1.9	2.5	3.9
Russet B.	L	M	5	4	6	6	0.2	1.7	2.4	3.2	3.4
Early Harvest											
A68673-9	0	LtRed	6	6	2	4	3.0	1.1	1.9	3.2	2.6
A74114-4	0-L	M-	4	4	2	7	1.7	3.0	2.7	1.7	1.5
A76147-2	0-L	Non	7	6	1	4	-	-	-	-	-
A76161-4	0-L	M	6	5	3	7	0.2	1.9	1.2	4.5	1.7
78-LC1	0-L	M-	4	4	5	9	-	-	-	-	-
NDA8694-3	0	Lt	4	4	8	9	1.5	2.6	1.5	3.2	2.4
Norgold Rus.	0-L	M-	4	4	7	8	0.2	1.8	1.3	3.9	2.0
Norgold M.	0-L	M-	4	4	4	8	-	0.8	1.5	4.3	1.2
Norgold 35	0-L	M-	4	4	4	8	-	0.3	1.4	4.5	1.7
Lemhi R.	L-0	M+	7	6	2	5	-	-	-	2.1	3.7
Russet B.	L	M-	6	6	3	6	-	-	-	2.4	2.9
LSD .05			1	1	2	1	1.8	1.0	0.7	1.2	1.1

1/ L=long, 0=L=oblong, etc.; Lt=light, M=medium, Hv=heavy russet, non=smooth skin.

2/ Late Harvest scored 8/24 & 9/2; Early Harvest scored 8/12, Early Blight scored 8/18. Scores 0-9 or 1-9, 0=none, 1=smallest/least to 9=tallest/most severe.

3/ E. bl.=Early blight, Net nec.=net necrosis, F. samb., F. coer.=Fusarium sambucinum, coeruleum; Scores: 0 (none) to 5.0 (most severe).

ID-OR Table 4. Distribution of clones, seedlings, and seeds - 1982.

LOCATION	COOPERATOR	NUMBER	LOCATION	COOPERATOR	NUMBER
<u>Clones:</u>					
Alabama	B. Bradford	1	Nebraska	R. O'Keefe	3
Alberta	D. Lynch	24	New York	B. Brodie	17
Argentina	H. Brücher	3	North Dakota	R. Johansen	1
Arizona	F. Harper	1	Oregon	J. Kelley	8
California	N. McHale	1		D. Moss	1
	R. Voss	41		J. Zalewski	96
Colorado	D. Holm	7	Pennsylvania	P. Grun	3
	K. Knutson	3	Peru	D. Midmore	2
	C. Urano	3	So. Dakota	L. Fine	3
Idaho	K. Anderson	10	Tennessee	C. Mullins	1
	R. Callihan	14	Texas	D. Smallwood	17
	J. Davis	4	Utah	F. Williams	2
	R. Dwelle	4	Washington	L. Hiller	1
	J. Hoggan	1		M. Martin	172
	M. Jacobs	1			
Michigan	G. Kleinkopf	1	Wisconsin	M. Groskopp	1
	R. Chase	13		R. Hanneman	4
Montana	G. Stallknecht	10		J. Schoeneman	8
<u>Seedling tubers or seeds:</u>					
Alberta	D. Lynch	77 families			
Argentina	H. Brücher	4 "			
California	R. Voss	66 "			
Colorado	D. Holm	142 "			
Missouri	T. Wagner	15 "			
North Dakota	R. Johansen	165 "			
Oregon	D. Hane	331 "			
	S. James	68 "			
Texas	D. Smallwood	83 "			
Missouri	T. Wagner	21 crosses			

Indiana

H. T. Erickson

Breeding for enhanced protein and specific gravity. A principle objective of the Indiana program is to develop clones with higher specific gravity when grown under hot temperatures of the corn belt. Standard varieties tend to be undesirably low in dry matter. With the recent development of rapid screening procedures for tuber protein this character is also included in the selection program. Progress in developing clones for higher specific gravity and for increased soluble protein is summarized in Tables 1 and 2. Protein values are expressed on a fresh weight basis.

Indiana Table 1. Soluble tuber protein of four potato populations.

Source	No. of clones	Ave. % protein	Protein range (%)
Named varieties	6	0.87	0.67-1.13
N. Central, unnamed	11	0.87	0.70-1.40
Purdue Advanced Sel.	22	1.23	0.83-1.80
Purdue Early Generation	31	1.24	0.70-1.86

Indiana Table 2. Tuber specific gravity of four potato populations.

Source	No. of clones	Ave. S. G.	S. G. range
Named varieties	6	1.072	1.060-1.078
N. Central, unnamed	11	1.074	1.061-1.092
Purdue Advanced Sel.	20	1.091	1.079-1.100+
Purdue Early Generation	24	1.084	1.063-1.100

It is apparent that the content of both protein and dry matter has been considerably improved. Of 20 advanced Purdue selections the lowest specific gravity clone was greater than the highest named variety tested. Protein enhancement was more modest but nonetheless substantial. The better clones are intercrossed in a continuing effort to further improve the protein and dry matter content.

The clone I 75-320-1 is being extensively used as a parent to transmit high yield. Its parentage includes Superior, Red Pontiac, Norland and a breeding line, I 66-142. It has reasonably high specific gravity and its progenies are very productive as a rule.

Scope of the breeding program. In 1982 advanced selections totaled 22 clones, grown in 20-hill plots. All had been screened for virus using the ELISA test. Viruses tested included S, Y, X, M, leafroll, and A. The early generation planting, in five hill units, consisted of 92 selections. The seedling planting handled as field transplants, was reduced to about 10,000. Approximately 60 selections were made at harvest.

One clone, I 78-59-1, was increased under certification and will be included in the 1983 North Central Trials. It is round, slightly russet, with reasonably high specific gravity and an excellent chipper at harvest. Yield and quality characteristics under different environments remain to be tested.

A North Central Trial was planted, and results are reported elsewhere. Clones, ND 534-4 Russ and Wisconsin 752, were exceptionally good on light sandy loam soil.

Louisiana

James F. Fontenot, D. W. Newsom, H. M. Brewer, A. C. Miller, W. A. Poillion, and P. Wilson

Introduction

The principal objectives of the Louisiana potato breeding project are wide adaptability, high yield, frost, heat and drought resistance, insect and (including chipping quality, french frying quality, and baking quality), resistance to after-cooking darkening, improved storage ability, better shape and skin color and resistance to tuber greening. Development of an oblong russet type adapted to Louisiana conditions is highly desirable.

Other objectives are to gain a further insight into the physiological changes during rest and to ascertain the effect of growth regulators, applied as preplant, preharvest treatment on the production, storage ability and quality of potatoes. The total alkaloid content must be investigated. Air pollution may be a limiting factor in potato production and cultivar selection is essential to minimize yield losses.

Very few southern states have seen fit to include potato breeding as a research project for their state. Since none of these states, including Louisiana, produce certified seed potatoes it is of utmost importance that wide adaptability be our primary objective. We are unique in this respect because we realize unless a new clone will produce well in the areas of certified seed production (north) it will not be available for southern production no matter what its producing potential.

Louisiana Trial

Clones from Minnesota, Wisconsin, North Dakota, and Louisiana were entered in the regional trial (table 1) and grown at Baton Rouge. The earliest clones in this trial were Norland and North Dakota 55-7 and the latest clone in maturity was Russet Burbank. Red Pontiac produced the highest total yield followed by Louisiana 42-38 and Wisconsin 752. More U.S. #1 tubers were harvested from Red Pontiac, Wisconsin 752 and Minnesota 10504. The average total solids was measured and the two best lines were Wisconsin 752 and North Dakota 388-1 Russ. The most outstanding cultivars in chipping ability were Norchip, North Dakota 55-7, North Dakota 388-1 Russ and Minnesota 10162. No scab nor blight was observed in this planting. The top five entries in overall worth as a variety were Wisconsin 752 first, Wisconsin 806R second, Minnesota 10504 third, Louisiana 42-38 fourth, and North Dakota 534-4 Russ fifth.

Data on our 1980 selections are found in table 2. The top lines in total production were 01-27, 01-56, 01-18, 01-29, and 01-28. The highest in U.S. #1's were 01-27, 01-56, 01-18, 01-29, and 01-28. The best clones in chipping

quality were 01-18, 01-28, 01-47, 01-41, and 01-51. The only cultivar which rated less than five in after-cooking darkening was 01-3.

Some data on advanced clones are in table 3. The top cultivars in all categories were Red LaSoda, LaChipper and 71-24.

Cooperative trials were conducted at Chase, Hammond, Port Sulphur, and Calhoun, Louisiana. Only data from Calhoun is presented and that is found in table 4. The top line in yield was 31-128, followed by Kennebec, LaChipper, 42-38 and Red LaSoda. The highest specific gravity tubers were harvested at this location and the top cultivars in total solids were Atlantic, 82-119, and 01-33. Excellent potato chips were made from 81-178, Atlantic, and LaChipper. Highly acceptable chips were made from 15 lines grown at Hammond yet the top lines were LaChipper, Atlantic, 01-33, 01-44, and 71-24.

For the sake of brevity data on our 1981 and 1982 selections are not presented. The best 1981 clone in Louisiana and Wisconsin was 12-59. Other excellent lines were 12-2, 12-20, 12-28, 11-50, 11-54 and 13-99. Exactly 115 selections were made in Wisconsin in 1982.

Louisiana Table 1. Yield and important information on some lines grown at Baton Rouge in 1982.

Sel. No. or Variety	Aver. Mat.	Most 2/ Representative Area-Type	CWT/A Aver. Yield	CWT/A Aver. Yield US #1	Aver. Percent US #1	Aver. Total Solids	Gen. Merit Rating	Chip Color	Early 5/ Blight Reading	Comments
Early to Medium Early										
Minnesota 10504	3	0	174	139	80	16.7	3	3.4		Fair Vigor
Norland	1	0	133	89	67	15.4		2.6		Medium Vigor
Medium to Late										
Nebraska A143-70-2	Not received		-	-	-	-	-	-	-	
Nebraska A71-72-1	Not received		-	-	-	-	-	-	-	
Nebraska A63-71-1	Not received		-	-	-	-	-	-	-	
Minnesota 9569	3	0	59	37	63	15.6		3.0		Fair Vigor
Minnesota 10162	4	0	148	95	64	17.1		2.4		Good Vigor
Louisiana 42-38	4	0	195	125	64	17.1	4	3.3		Good Vigor
Wisconsin 752	2	0	183	148	81	18.6	1	2.6		Good Vigor
Wisconsin 806R	3	0	163	128	79	16.5	2	2.6		Medium Vigor
North Dakota 388-1Rus	4	0	123	88	72	16.7		2.4		Good Vigor
North Dakota 534-4Rus	4	0	134	125	93	15.4	5	3.0		Good Vigor
North Dakota 55-7	1	0	129	81	63	17.5		2.2		Medium Vigor
Red Pontiac	4	0	235	182	77	17.3		3.6		Very Vigorous
Norchip	3	0	71	45	63	16.5		1.9		Medium Vigor
Russet Burbank	5	0	138	50	36			3.8		Very Vigorous
Norgold Russet	3	0	111	76	68			4.0		Medium Vigor

1/ 1-Very Early-Norland maturity; 2-Early-Irish Cobbler maturity; 3-Medium-Red Pontiac maturity; 4-Late-Katahdin maturity
5-Very Late-Kennebec or Russet Burbank maturity.

2/ AREA - T-less than 1%; 1 - 1-20%, 2 - 21-40%; 3 - 41-60%; 4 - 61-80%; 5 - 81-100%. TYPE - 1. Small, superficial;
2. Larger, superficial; 3. Larger, rough pustules; 4. Larger pustules, shallow holes; 5. Very large pustules, deep holes.

3/ Place top five among all entries including check varieties; disregard maturity classification. (Rate first, second, third, fourth and fifth (in order) for overall worth as a variety.

4/ Chip Color - PCII Color Chart or Agtron.

5/ Early Blight - 1-susceptible; 5-highly resistant.

Louisiana Table 2. Yield and other notes on some advanced clones grown at Baton Rouge in 1982.

	Yield		Aver. Percent					
	US #1	Total	US #1	Maturity*	Vigor**	Specific Gravity	Chip Rating***	After-cooking Darkening****
	cwt/A	cwt/A						
01-3	70	109	64	late	good	1.072	3.0	4.8
02-13	79	103	77	medium	good	1.066	3.4	7.8
01-18	116	151	77	medium	excellent	1.068	1.8	5.2
01-19	67	91	74	medium	fair	1.071	3.0	6.2
01-20	57	75	76	late	good	1.064	4.2	5.2
01-21	62	92	67	med.-early	good	1.069	5.0	6.4
01-22	54	59	92	late	good	-	-	-
01-27	132	164	80	med.-early	good	1.064	3.0	7.4
01-28	95	121	79	late	good	1.079	2.3	7.0
01-29	100	123	81	late	good	1.067	3.0	5.2
01-33	75	89	84	very late	excellent	1.067	3.2	6.2
01-38	94	103	91	very late	good	1.070	3.6	6.8
01-41	91	106	86	late	good	1.069	2.8	4.2
01-47	72	92	78	very late	good	1.061	2.6	6.2
01-51	84	111	76	late	good	1.071	2.8	6.6
01-53	89	107	83	medium	good	1.063	3.0	7.6
01-54	48	69	70	medium	medium	1.070	3.0	5.2
01-55	79	109	72	medium	good	1.069	3.2	6.4
01-56	130	164	79	medium	excellent	1.068	3.2	5.6

*1-very early, 5-very late

**1-weak, 5-very vigorous

***1-very light color-highly desirable, 10-very dark color-unacceptable

****1-very white, 10-very dark

Louisiana Table 3. Data on other advanced clones grown at Baton Rouge in 1982.

	Yield		Aver. Percent					
	US #1	Total	U.S. #1	Maturity*	Vigor**	Specific Gravity	Chip*** Rating	After-cooking Darkening****
	cwt/A	cwt/A						
1. 71-24	110	119	92	3	4	1.060	2.6	5.4
2. 71-96	70	96	73	5	5	1.063	2.8	5.4
3. 31-124	66	75	88	2	4	1.060	3.6	5.8
4. 31-128	57	83	69	3	4	1.064	3.4	7.0
5. 43-18	97	119	82	4	4	1.068	2.8	4.4
6. Red LaSoda	114	127	90	4	5	1.057	4.0	6.4
7. Atlantic	75	93	81	3	3	1.089	3.8	7.2
8. 42-38	62	84	74	4	5	1.076	3.6	5.8
9. LaChipper	110	128	86	3	4	1.073	3.2	6.2
10. Belrus	35	44	80	3	2	1.077	3.2	8.0

*1-very early, 5-very late

**1-weak, 5-very vigorous

***1-very light color-highly desirable, 10-very dark color-unacceptable

****1-very white, 10-very dark

Louisiana Table 4. 1982 Irish Potato Variety Trial - Calhoun, La.

Variety	Yields (CWT. Per Acre)			Remarks
	1's	2's	Total	
31-128	211	33	244	Slightly russet, smooth, oval to oblong white
Kennebec	204	26	230	Slightly rough, oblong white
LaChipper	198	26	224	Oval, white
42-38	188	39	227	Smooth, oval red
Red LaSoda	185	46	231	Slightly rough, red
01-24	180	31	211	Nice oblong white
01-33	155	29	184	Slightly russet, oval white, some sprouting
01-43	147	42	189	Smooth, oval to oblong white
71-96	143	40	183	Smooth, oblong white
31-124	142	46	188	Long white
82-119	140	56	196	Smooth, oval to oblong red
01-44	140	19	159	Very smooth, oval to oblong white
81-178	138	44	182	Smooth, oblong white
01-3	129	44	173	Smooth, oval to oblong white
Atlantic	124	18	142	Oval to oblong, russet white

MAINE

S.S. Leach, R.E. Webb and
D.R. Wilson

Resistance to *Fusarium* Tuber Rot (*Fusarium* *roseum* 'Sambicum')

Inoculum for this test was grown on potato dextrose agar. Spores were washed from seven day old cultures and adjusted to 50,000 per ml. The tubers of the test clones were inoculated with a hypodermic syringe midway between the bud and stem ends. The inoculum (100 spores) was injected into the tubers 7 mm below the tuber surface. The inoculated tubers were stored in a controlled environment room maintained at 55°F (13°C) and 95 percent relative humidity for 21 days. At the end of the storage period, the tubers were removed and scored for tuber rot development and amount of sprouting. The degree of rot in a tuber was determined by cutting through the inoculation sites and observing the degree of infection. This year, five round white and five russet-type clones were tested. Because of a lack of round white tubers for testing, only the russet types were tested for their reaction to both strains of the fungus. Clone B7200-33 is the reference clone as it has shown a very high degree of resistance in previous tests.

Clones B7200-33, and B9540-55 showed high degree of resistance and B9540-62 moderate Table 1. Clone B9540-55 showed no visible fungal activity and appeared immune. Further testing with this clone should be continued to determine its mode of resistance and resistance to other strains of *Fusarium*.

Maine, Table 1. Resistance of breeding clones to *Fusarium roseum* 'Sambicum'.

Clone	Disease rating ^{1/}
Round type	
B6969-2	0
B7805-1	0
B9140-32	0
Atlantic	0
B7200-33	8
Russet type	
BelRus	0
B9398-2	0
B9399-1	0
B9540-55	9
B9540-62	5

^{1/} Rating on a 0-9 scale; 9 = no disease;
0 = severe disease symptoms.

Hugh J. Murphy and Leigh S. Morrow

Cooperative variety trials were conducted during 1982 at Presque Isle and Newport, Maine. Soil and weather conditions during May were excellent for planting but during June, moisture was very limited. Good stands were obtained for most varieties and early growth was excellent. By July, however, soil moisture was below normal and wilting of many varieties resulted. During August, moisture was at least four-acre inches above normal which triggered growth cracks, hollow heart, misshapen, and knobby tubers. At Newport, conditions were exceptionally dry for late June, July, and most of August which decreased yields below acceptable levels.

Plots at all test locations were 25 feet long, single rows, and replicated six times per variety. Planting, killing, and harvest dates plus seedpiece spacing and fertilization rates at both locations are presented in Maine Table 4.

Yields and specific gravities for all varieties grown at Presque Isle and Newport are presented in Maine Table 1. Rosa, F73008, BR7093-23, Katahdin, and AF238-66 were high yielding at Presque Isle.

Tuber size distribution determinations are presented in Maine Table 2. Because of the dry July and early August, percentage of tubers larger than 2½ inches or 4 ounces in weight were low and at Newport extremely low. Most varieties had some percentage of growth cracks, hollow heart, and misshapen tubers.

Results of the first chipping and french fry color tests with tubers from 50° F storage are presented in Maine Table 3. Not many varieties grown at Presque Isle had satisfactory chip color but many had satisfactory french fry color. Many varieties grown at Newport had satisfactory chip color.

Complete details of the Maine cooperative trials are presented in the 1982 Performance Evaluations of Potato Clones and Varieties in the Northeastern States. This will be published by the Maine Agricultural Experiment Station as Bulletin 788, and will be available from the Public Information and Central Services (PICS), University of Maine; Orono, Maine 04469.

Maine Table 1. Yield by hundredweight per acre and specific gravity for varieties grown at two locations in Maine - 1982.

Variety	Presque Isle		Newport	
	Yield	Specific gravity	Yield	Specific gravity
Atlantic			163	1.090
Belchip			162	1.090
Caribe	347	1.074		
Chipbelle			116	1.091
Denali			140	1.091
GoldRus	318	1.078		
Katahdin	382	1.079	106	1.074
Kennebec	335	1.079	165	1.080
Michibonne	361	1.076	164	1.075
Michimac	370	1.078	147	1.075
Monona			64	1.074
Norchip			108	1.082
Oceania			117	1.071
Rideau	343	1.079		
Rosa	412	1.076	147	1.080
Russet Burbank	436	1.087		
Saco			119	1.084
Simcoe	269	1.074	87	1.077
Superior	247	1.077	122	1.080
Trent	269	1.090	139	1.094
Yukon Gold	260	1.088	151	1.092
AF201-25	327	1.076	143	1.080
AF221-1	283	1.080	96	1.075
AF222-1	127	1.077	83	1.083
AF236-1	303	1.076	143	1.080
AF238-66	387	1.073	137	1.076
AF303-5	361	1.085	172	1.081
AF307-5	303	1.071		
AF330-1	202	1.074	117	1.077
AF332-9	335	1.080	146	1.077
AS201-10	238	1.070	128	1.076
B5662-WV13	280	1.081		
B6043-WV6	359	1.074	134	1.075
B6928-WV14	294	1.076		
B6949-WV3	257	1.073		
B7019-WV1	286	1.068		
B8833-6	274	1.076	106	1.086
B8934-4	333	1.079		
B8943-4	300	1.076		
BR7088-18	337	1.089		
BR7093-23	397	1.083	123	1.083
C7232-4	245	1.075	85	1.074
C7490-2	304	1.074	99	1.077
C74109-8	373	1.074	167	1.078
CF7353-1	330	1.078	159	1.077
CF7523-1	203	1.079	185	1.080
CF7688-9	280	1.087	105	1.092
CF72107-15	305	1.075	84	1.079
CF74135-3	203	1.059	132	1.063
CF76183-2	195	1.070	91	1.072
F73008	404	1.080	164	1.083
G712-1	249	1.078	121	1.078
MN7973	326	1.073		
MN8224	272	1.087		
MN8757	331	1.068		
MN9319	374	1.083		
Waller Duncan				
L.S.D. (0.05)	28	0.004	39	0.005

Maine Table 2. Percentage of yield between 1-7/8 and 4 inches in diameter for varieties grown at Presque Isle and Newport, Maine - 1982.

Variety	Presque Isle		Newport	
	1-7/8	2-1/2	1-7/8	2-1/2
	to 4 inches	to 4 inches	to 4 inches	to 4 inches
Atlantic			94.4	50.3
Belchip			91.8	31.9
Caribe	97.7	62.5		
Chipbelle			82.8	11.9
Denali			88.0	18.9
GoldRus	62.7% 4 - 10 ounces			
Katahdin	95.4	55.3	87.6	19.1
Kennebec	96.9	72.4	94.9	40.9
Michibonne	98.2	75.5	95.9	44.4
Michimac	93.8	53.2	87.6	23.2
Monona			72.4	9.7
Norchip			76.0	10.1
Oceania			88.7	19.3
Rideau	96.2	68.9		
Rosa	93.3	41.1	79.6	17.1
Russet Burbank	52.4% 4 - 10 ounces			
Saco			82.6	15.0
Simcoe	97.4	54.6	89.3	20.3
Superior	95.8	44.5	87.8	11.8
Trent	95.5	48.1	86.2	10.4
Yukon Gold	95.9	60.4	89.9	36.2
AF201-25	96.3	54.4	89.4	23.9
AF221-1	92.9	46.0	66.2	8.4
AF222-1	84.5	23.7	77.8	8.6
AF236-1	95.5	48.6	87.4	13.0
AF238-66	93.8	35.6	78.8	8.5
AF303-5	96.5	62.5	93.3	34.9
AF307-5	94.4	41.1		
AF330-1	93.9	34.3	73.9	12.3
AF332-9	95.5	54.5	88.1	23.2
AS201-10	93.3	30.7	83.5	13.1
B5662-WV13	95.6	62.2		
B6043-WV6	94.6	48.0	88.3	18.5
B6928-WV14	93.8	56.7		
B6949-WV3	92.4	69.4		
B7019-WV1	97.6	66.8		
B8833-6	87.6	18.7	68.0	6.1
B8934-4	57.5% 4 - 10 ounces			
B8943-4	51.5% 4 - 10 ounces			
BR7088-18	94.5	48.0		
BR7093-23	93.5	38.7	85.2	14.2
C7232-4	96.0	37.4	82.4	15.8
C7490-2	96.1	31.9	81.4	3.6
C74109-8	95.9	41.1	88.7	26.9
CF7353-1	95.6	47.2	89.4	14.8
CF7523-1	92.3	39.9	87.8	20.0
CF7688-9	93.7	44.8	86.9	31.1
CF72107-15	96.6	62.9	87.8	18.5
CF74135-3	83.5	9.8	73.7	5.7
CF76183-2	92.9	35.7	76.7	4.0
F73008	94.5	36.5	88.2	9.1
G712-1	93.1	44.4	89.6	18.3
MN7973	97.9	63.7		
MN8224	91.7	34.0		
MN8757	93.4	72.1		
MN9319	66.8% 4 - 10 ounces			

Maine Table 3. Chip color and french fry color and texture indices for potato varieties grown at Presque Isle and Newport, Maine - 1982.

Variety	Presque Isle			Newport
	Chip Color ¹	French fry Color ²	Texture ³	Chip Color ¹
Atlantic				7.6
Belchip				7.9
Caribe	8.0	1.4	1.1	
Chipbelle				7.0
Denali				7.1
GoldRus	8.0	2.0	2.0	
Katahdin	9.4	2.9	2.4	8.1
Kennebec	8.7	2.4	1.7	8.0
Michibonne	9.6	3.5	2.4	8.5
Michimac	9.3	3.1	2.6	8.1
Monona				5.0
Norchip				6.6
Oceania				7.7
Rideau	10.0	4.6	2.8	
Rosa	8.3	1.4	2.5	6.8
Russet Burbank	10.0	4.2	2.1	
Saco				8.9
Simcoe	7.4	1.2	1.1	5.3
Superior	8.9	2.6	1.3	8.0
Trent	7.7	1.4	1.8	5.7
Yukon Gold	9.6	3.0	2.2	9.0
AF201-25	9.3	2.5	2.7	8.6
AF221-1	8.1			7.2
AF222-1	8.5	3.0	1.4	8.5
AF236-1	5.4			5.2
AF238-66	8.3	1.6	1.9	7.0
AF303-5	8.2	3.1	2.4	7.4
AF307-5	8.8	3.4	1.4	
AF330-1	6.6	1.1	1.9	4.9
AF332-9	9.3	3.2	1.4	8.5
AS201-10	8.6	2.7	1.1	8.0
B5662-WV13	8.2	1.8	2.4	
B6043-WV6	10.0	4.2	2.2	9.6
B6928-WV14	10.0	4.1	2.4	
B6949-WV3	9.7	3.3	2.3	
B7019-WV1	8.8	2.5	2.2	
B8833-6	9.5	2.8	1.3	8.4
B8934-4	8.7	2.3	2.4	
B8943-4	9.2	3.1	2.8	
BR7088-18	8.0	2.0	1.7	
BR7093-23	8.0	2.0	1.8	7.3

Maine Table 3 - continued

Variety	Presque Isle			Newport
	Chip Color ¹	French fry Color ²	fry Texture ³	Chip Color ¹
C7232-4	4.7	1.0	1.3	4.8
C7490-2	7.4	2.4	3.0	7.3
C74109-8	9.1	2.6	1.8	8.7
CF7353-1	8.1	1.4	2.6	6.5
CF7523-1	9.8	3.6	2.0	8.5
CF7688-9	8.2	2.4	1.6	7.3
CF72107-15	8.8	2.6	2.4	7.3
CF74135-3	9.3	3.4	1.4	8.0
CF76183-2	7.6	1.1	2.4	6.4
F73008	9.6	2.9	2.4	7.4
G712-1	8.1	1.6	1.5	7.3
MN7973	8.8	2.6	2.5	
MN8224	7.3	1.1	2.6	
MN8757	10.0	4.5	2.0	
MN9319	8.1	2.5	2.7	
Waller Duncan				
L.S.D. (0.05)	0.3	0.4	0.3	0.6

¹Chips with lower indices are lighter in color as read on PCII Reference Chart 1206-U.

²French fries with lower indices are lighter in color as read from U.S.D.A. Color Standards for Frozen French Fries.

³Lower texture indices indicate a mealier texture.

Maine Table 4. Pertinent Information About the Maine Cooperative Potato Variety Trials - 1982.

Location and Maturity Season	Date Planted	Date Killed	Date Harvested	Fertilization	Seedpiece Spacing
<u>Presque Isle</u>					
Early & Med. Early Varieties	May 14	August 25	September 14	125-125-125	<u>1/</u>
Medium Varieties	May 15	September 4	September 20	125-125-125	<u>1/</u>
Medium Late Varieties	May 15	September 8	September 20	125-125-125	<u>1/</u>
Late Varieties	May 15	September 8	September 30	130-130-130	<u>1/</u>
Russet & Long Type Varieties	May 15	September 21	October 4	130-130-130	<u>2/</u>
<u>Newport</u>					
All Varieties	May 19	September 7	September 29	140-140-140	<u>1/</u>

^{1/} Seedpieces of all varieties spaced 8 inches apart.

^{2/} Seedpieces of MN9319 and B8943-4 spaced 10 inches apart.

Seedpieces of B8934-4 and GoldRus spaced 12 inches apart.

Seedpieces of Russet Burbank spaced 16 inches apart.

Potato Breeding

Seed and seedling production. As in past years, emphasis has been on high-yielding, high-solids parents which are resistant to golden nematode, russet-skinned, bruise resistant, and disease resistant as well. Diseases considered of major importance are scab and verticillium. Fifty-five parents were used in making 53 crosses to produce 35,210 seeds. From open-pollinated fruits of a verticillium resistant plant, 45,750 seeds were obtained. Seeds from 139 family lines were sown in April and in June. The first planting produced 7,243 seedlings which were moved outside for the summer and harvested in September. The second planting produced 4,634 seedlings which were kept in the greenhouse and harvested in October and November. An average of 86% (10,185) of the seedlings produced tubers large enough to harvest; 65% (7,702) had second tubers.

Method of planting. All seed increase plots were again grown on the Gartley Farm in Presque Isle. Disease tests were grown at Aroostook Farm, and yield tests were at the University of Maine, Presque Isle fields. Fertilization rate was 115 pounds per acre of nitrogen, applied in the form of 14-14-14 for all plots on the Gartley Farm, and for early maturity tests at the other locations. Medium maturity yield tests received 130 pounds nitrogen, and late maturing tests, including storage tests, sensory tests, hollow heart test, chip tests, and bruise test received 145 pounds nitrogen. Seed piece spacing was 10 inches for all plots except the single-hills (30 inches) and the hollow heart test (20 inches). Yield tests were divided into four replications of twenty hills each. Chip, hollow heart, and bruise tests also were divided into four replications.

	<u>Gartley Farm</u>	<u>Aroostook Farm and UMPI</u>
Planting dates	5/12-14	5/14-15, 17-18, 10-21, 24-26
Killing dates	8/10, 23, 30	8/16, 17, 23, 25, 30: 9/7, 8, 13
Harvest dates	8/31; 9/9-11, 13, 14, 27	8/31; 9/13, 20, 22, 24, 29, 30; 10/1, 4

Seedling selection. A total of 370 (2.1%) selections were saved from approximately 17,500 single-hill seedlings. From the 332 12-hill selections, 62 (18.7%) were saved for further testing. Fifty-one third year selections were tested in 20-hill, 60-hill, and disease plots. All but one were retained for further testing.

Cell cloning. Fifty-eight clones from the 1981 production were replanted for selection in 1982. Only three (5.2%) were saved for further testing. This material was derived from Russet Burbank leaves, and was very knobby this year. An additional 74 clones were increased for 1983 selections.

Disease tests. In cooperation with Drs. Frank Manzer, Richard Storch, Bill Brodie (Cornell University), Ray Webb (Beltsville), Bob Goth (Beltsville), Gilbert Banville (Quebec), and Robert Young (West Virginia), a number of selections were tested for resistance to the disease listed below. Resistance to early blight was found in 7 of 69 tested; to late blight in 11 of 66; to leafroll in 2 of 92; to common scab in 14 of 111; to acid scab in 5 of 55; to verticillium in 6 of 77; to golden nematode in 21 of 115; to rhizoctonia in 3 of 4; to net necrosis in 78 of 81; to greening in 67 of 119; to bruising in 10 of 52; to hollow heart in 15 of 50; and to virus Y in 2 of 32.

Yield tests. A total of 169 selections were tested in replicated yield tests in 1982. Eighteen of these out-yielded standard checks; nine had higher specific gravities, and one was better for both characteristics. Data from the ten yield tests are given in tables 1 through 10.

Chip tests. In chipping test number 1, four named varieties and 34 advanced selections were chipped from storages held at 45° F and 38° F. The 38° material was reconditioned for three weeks at 70° F. These samples were all processed in February. Results are in Table 11.

Chip test number 2 included eight advanced selections and six named varieties. Samples were processed in December, February, and April after storage at 55° F, 50° F, 45° F, and 38° F. The 38° material was reconditioned for three weeks at 70° F before cooking. Results of the December and February cooking are shown in Table 12.

Grower trials of advanced selections. Eight selections were grown in commercial situations in 1982. Three were in their second year of commercial trials: AF 205-9, AF 186-5, and C 26-1a. More than twenty growers produced a crop of AF 205-9. Only one had problems with storage breakdown. Size was variable from farm to farm, and shape and bruising also varied to a certain extent. Most growers were pleased with this selection, and it has been named Yankee Chipper. Approximately 350 - 400 acres will be grown in 1983.

Eleven growers had experience with AF 186-5. The results were even more variable, ranging from "ugly, discard" to "worth naming". Yields on some farms were better than AF 205-9, on other farms worse. Reports from Michigan and Ohio, as well as commercial tests on Long Island, were favorable, and this has been named Islander. Only five and a half acres of seed were grown in 1982.

Nineteen acres of seed of CC 26-1a were planted by five growers. Yields and bruise resistance were notable in this selection. It also has high dry matter. This has been named Yankee Supreme.

CF 7358-14 is an early, golden nematode resistant selection which will be tested further. CF 7523-1 is similar, but higher yielding, and will also be tested further commercially. BR 7093-23 was somewhat small in size, and limited in seed available; it will also be tested further. WF 564-3 is the only russet among the eight; it is a good tablestock selection with high yields; approximately 20 acres will be grown commercially in 1983. AF 238-21 had problems with verticillium and storage rot in one test, and Phoma rot in another. It will be discarded.

The important characteristics of these eight selections and other advanced selections from the Maine breeding program are given in Table 13. The most advanced selections from the Campbell program are listed in Table 14.

Maine Table 1. Summary of Aroostook Farm early maturity yield test (95 days), Presque Isle, Maine, 1982

Pedigree	Cwt/A $\sqrt{17/8}$	Percent US 1	Specific Gravity	Maturity ^{1/}	Color ^{2/}	Appearance ^{3/}	Shape ^{4/}	French Fries	
								50° F $\sqrt{5/}$	38° F $\sqrt{5/}$
								Color ^{6/}	Texture ^{7/}
AF 222- 1	205	84	1.074	ME	WN	3-	R	4.5	2.2
AF 307- 5	317	96	71	E	W!	5	R	4.9	2.0
AF 339- 5	335	98	76	M	Wpi	3	O, fl	4.6	2.0
AF 508- 2	295	92	64	E	W	4	R(O)	3.6	2.4
AS 201-10	271	85	70	E	WC	4+	R	4.8	2.1
CF74135- 3	245	85	63	E	W	4	R	5.0	2.0
CF 7615- 4	316	95	73	ME	W	3+	L, (fl)	5.2	2.0
CF 7622- 6	350	93	62	ME	W	5	O	7.3	2.0
CF 7679-15	321	93	81	ME	W	5	R	5.0	1.9
CF76136-11	299	91	82	ME	W(N)	3+	O	4.0	2.8
CF 7709- 1	282	91	68	ME	W	4-	R(O)	7.2	2.0
CF 7719- 6	346	93	66	E	WN	4	OR	4.1	2.4
CF 7722-19	304	95	72	ME	WN	4	RO	7.0	2.0
CF 7750- 1	301	95	74	ME	LR	3	O	6.0	2.2
CF77161- 3	308	90	72	E	W(N)pu	4	O	6.1	2.0
WF 564- 3	352	92	69	ME	R	4	L	6.9	2.2
WF 591- 1	314	95	75	M	LR	3	R	7.0	2.0
Superior	299	95	78	ME	CN	4	R	5.5	2.0
LSD (0.1)	33.8	2.9	.0026						

1/ E = early, M = medium, L = late.

2/ R = Russet, W = white, C = cream, Re = red, Pi = pink, B = buff, Pu = purple, Y = yellow, D = dark, L = light,

N = netted, lower case refers to eye color.

3/ 1 = poor to 5 = excellent.

4/ R = round, O = oblong, L = long, fl = flat.

5/ Tubers stored 3 months. Those stored at 38° F were reconditioned for three weeks at 70° F.

6/ From National Potato Chip Institute Chart 1206-U were 1 = very light and 10 = very dark.

7/ 1 = mealy, 3 = soggy.

Maine Table 2. Summary of Campbell early maturity yield test (95 days), Aroostook Farm, Presque Isle, Maine, 1982

Pedigree	Cwt/A > 1 7/8"	Percent US 1	Specific Gravity	Maturity ^{1/}	Color ^{2/}	Appearance ^{3/}	Shape ^{4/}	French Fries	
								50° F 5/	38° F 5/
								Color ^{6/}	Texture ^{7/}
CS 7526- 6	316	95	1.077	ME	LC	3+	R	3.0	1.9
CS 7589- 8	402	96	66	ME	W	5	R	4.7	2.0
CS 7697-24	414	96	73	ME	W	3+	R	5.0	2.0
CS76111-12	294	97	74	ME	YC	3	RO	4.3	2.1
-14	315	96	68	E	YC	4	R	3.5	1.9
CS76175-9R	290	91	77	ME	CN	3-	RO	5.8	2.0
CS 7747- 7	359	94	80	E	W	3+	L	5.5	2.7
CS 7755-42	337	90	64	ME	CN	4	R	6.8	2.0
CS77120-1R	291	91	77	M	R	4	O	5.5	2.0
CS77127-36	320	97	75	M	W	4	R	4.8	2.0
CS 7920- 3	276	92	76	M	W(N)	3+	LL	3.5	2.2
CS 7958- 1	381	97	66	M	W	4-	O	5.5	2.2
CS 7966- 7	358	96	77	ME	W	4	OR	7.8	2.0
CS79123- 2	265	92	77	ME	R	3+	OR	4.0	1.7
Monona	252	90	71	M	W	3	R	4.0	2.3
Superior	303	95	76	ME	CN	3-	R	5.0	2.0
LSD (0.1)	25.7	2.8	.0025						
								4.6	1.0
								7.9	1.5
								7.5	1.1
								6.3	1.8
								5.9	1.9
								8.8	1.0
								7.5	2.7
								7.2	1.8
								5.6	1.4
								6.5	1.5
								6.9	1.3
								10.0	1.9
								9.8	2.2
								7.3	1.0
								3.6	2.6
								6.4	1.5

1/ - 7/ See footnotes on Maine Table 1.

Maine Table 3. Summary of Aroostook Farm early-medium maturity yield test (101 days), Presque Isle, Maine, 1982

Pedigree	Percent US 1			Specific Gravity	French Fries			French Fries		
	Gwt/A	> 1 7/8"			1/ Maturity	2/ Color	3/ Appearance	4/ Shape	5/ Color	6/ Texture
AF 299-12	272	96	1.068	M	W!	4+	R(O)	4.5	2.0	6.4
AF 330- 1	231	93	80	E	W	3	R	3.0	2.0	2.3
AF 421-13	295	96	70	M	W	4	RO	5.0	2.0	6.0
AF 474- 2	366	97	77	ME	W	5	OR	6.0	2.1	7.1
CF72111- 5	387	96	81	ME	W	3-	O	6.0	2.2	7.5
CF 7508- 1	321	96	75	M	CN	4	O	4.1	2.0	6.6
CF 7598- 4	292	94	78	ME	W	3-	O	4.5	2.0	7.7
CF 7608- 9	317	94	71	E	WN	4	RO	4.5	2.6	6.9
CF 7688- 9	295	95	88	ME	W	3	R	4.2	2.0	4.7
CF76183- 2	290	93	76	E	W(N)	3+	OL	3.5	2.2	6.1
CF77143-10	304	93	66	E	WN	3	O	4.0	2.6	7.3
CF78103- 1	289	90	80	E	W(N)	4	RO	4.3	2.2	6.5
CF79211- 1	313	94	73	E	R	4	RO	5.0	2.0	8.0
CS 7296- 5	332	96	78	ME	W!	4+	RO	5.0	2.1	6.1
Kennebec	380	97	81	ML	W	3+	O	4.5	2.0	5.0
Superior	344	96	79	E	WG	4	R	4.7	2.0	6.3
LSD (0.1)	31.6	1.9	.0025							

1/ - 7/ See footnotes on Maine Table 1.

Maine Table 4. Summary of Campbell early-medium maturity yield test #1 (101 days), Presque Isle, Maine, 1982

Pedigree	Gwt/A \geq 1 7/8"	Percent US 1	Specific Gravity	Maturity ^{1/}	Color ^{2/}	Appearance ^{3/}	Shape ^{4/}	French Fries	
								50° F 5/	38° F 5/
								Color ^{6/}	Texture ^{7/}
AS 313-10	354	95	1.068	E	WN	3	R	6.5	2.1
CS 7508-17	338	93	70	ME	W	4	R	6.0	2.0
CS 7533-25	417	98	69	M	W	4	R	4.0	2.0
CS 7624-16	232	85	68	E	W	5-	RO	5.5	2.0
CS 7679-26	287	92	78	ME	CN	4-	O	4.0	2.0
CS 7684- 9	308	93	68	E	CN	3	R	5.4	2.2
CS 7685- 6	340	96	76	ME	W(N)	4+	R	7.1	2.0
CS76169- 5	322	98	76	ME	W	5	R(O)	5.0	2.0
CS76204- 3R	302	91	80	E	BN	3+	R	4.6	2.0
CS 7756- 9	305	92	73	E	W	4+	R	6.3	2.3
CS77114-14	358	97	67	E	W!	4+	R	6.7	2.0
CS77119-21	359	97	75	E	W	4+	O	4.9	2.0
CS77120- 8	441	96	79	ME	W!	4+	R	4.6	2.4
CS77151-10	357	95	78	ME	WN	3	RO	4.8	2.0
Kennebec	368	97	77	ME	W	3-	RO	4.7	1.9
Superior	316	96	79	E	CN	3+	R	6.1	2.2
LSD (0.1)	29.5	2.5	.0036						

1/ - 7/ See footnotes on Maine Table 1.

Maine Table 5. Summary of Campbell early-medium yield test #2 (101 days), Presque Isle, Maine, 1982

Pedigree	Cwt/A \angle 1 7/8"	Percent US 1	Specific Gravity	Maturity ^{1/}	Color ^{2/}	Appearance ^{3/}	Shape ^{4/}	French Fries		French Fries	
								50° F ^{5/}	38° F ^{5/}	Color ^{6/}	Texture ^{7/}
CS 7910-18	299	96	1.066	E	WN	4	R	4.9	2.0	5.4	2.5
CS 7919-11	343	96	73	M	C	4-	RO	5.0	2.0	6.5	1.2
CS 7952- 1	391	97	77	M(L)	W	3+	O	3.5	2.4	5.6	1.9
-16	317	97	65	E	WC	4+	RO	4.0	2.5	5.3	2.5
CS 7963-21	257	94	77	E	CN	3	R	3.5	2.0	5.1	1.7
CS 7973- 9	321	96	71	ME	WN	4	OL	6.3	2.2	7.6	2.4
CS 7983-19	237	95	69	E	CN	3-	RO	3.5	2.0	6.1	2.5
-40	297	95	75	E	WN	3+	R	3.8	2.0	7.1	1.1
CS 7994- 2	306	95	79	ME	DCN	3+	RO	5.0	2.1	6.6	1.2
CS79123-12	380	96	75	E	LR	4-	OR	5.5	2.0	8.8	1.7
CS79147- 1	280	97	75	E	WC	4+	RO	3.5	2.0	6.0	1.5
CS79170- 3	289	95	77	E	W(N)	4-	OL	4.0	2.0	3.7	2.0
CS79256- 2	360	98	74	E	WN	4-	R	6.3	2.0	7.4	1.4
Kennebec	384	98	80	M	W	3+	R,fl	4.5	2.0	5.1	1.9
Monona	262	95	71	ME	W	3+	R	3.2	2.2	3.1	1.8
Superior	292	95	75	E	WN	3	R	4.7	2.0	6.0	2.1
LSD (0.1)	23.9	1.7	.0032								

1/ - 7/ See footnotes on Maine Table 1.

Maine Table 6. Summary of Aroostook Farm medium maturity yield test #1 (107 days), Presque Isle, Maine, 1982

pedigree	Cwt/A 1 7/8"	Percent US 1	Specific Gravity	Maturity ^{1/}	Color ^{2/}	Appearance ^{3/}	French Fries			French Fries		
							50° F ^{5/}	38° F ^{5/}		50° F ^{5/}	38° F ^{5/}	
							Shape ^{4/}	Color ^{6/}	Texture ^{7/}	Color ^{6/}	Texture ^{7/}	
AF 92- 3	345	93	1.071	ME	W	2	O,fl	5.0	2.7	8.7	2.1	
AF 236- 1	413	97	81	ME	W	4	R	3.0	2.4	4.5	2.0	
AF 238-66	364	95	72	ME	W(N)	4+	O	4.0	2.0	5.9	2.0	
AF 262- 7	326	93	82	E	W!	4	R	4.0	2.3	5.9	2.3	
AF 303- 5	439	97	81	L	WN	3	R	4.5	2.3	7.5	2.0	
AF 324- 1	273	97	83	E	W	3+	R	3.0	1.8	3.5	2.0	
AF 332- 9	347	96	81	M	W!	3+	R	4.2	2.0	9.0	2.0	
AF 371-66	289	95	71	E	LLR	4+	RO	4.0	2.0	5.7	2.0	
AF 386-10	321	95	74	E	CN	4	RO	3.8	2.2	7.5	2.0	
AF 431-17	270	87	87	E	WN	3	R	4.0	2.0	6.7	1.9	
AF 465- 2	369	95	82	ME	LLRpi	4+	RO,fl	6.1	2.2	7.6	2.2	
AF 500-13	338	97	87	ME	LR	3+	O	4.0	2.5	7.6	2.3	
AF 522- 1	440	97	84	M	W	4+	L	7.0	2.0	10.0	2.0	
BR 7090-17	268	95	81	M	W	4	R	3.5	2.0	4.5	1.9	
CF72107-15	358	97	77	ME	W	4+	R	4.8	2.1	8.5	1.7	
CF 7353- 1	375	96	77	M	Pu	3+	R	3.0	2.0	7.2	1.8	
CF74132- 1	340	97	78	E	W	4+	RO	4.0	2.0	7.7	2.0	
CF 7587- 7	326	91	81	M	W(N)	4	RO	6.0	2.0	8.0	2.0	
CF 7646- 3	244	82	78	E	CN	3	R	4.5	2.0	8.2	2.2	
Katahdin	384	96	80	NL	W	4	R,fl	6.2	2.1	7.8	2.0	
Kennebec	427	98	83	M	C	3-	R	3.9	2.0	7.1	2.0	
Mohawk	365	98	89	NL	W	3	RO,fl	6.5	2.0	7.5	1.6	
LSD (0.1)	30.8	1.8	.0027									

1/ - 7/ See footnotes on Maine Table 1.

Maine Table 7. Summary of Aroostook Farm medium maturity yield test #2 (107 days), Presque Isle, Maine, 1982

Pedigree	Cwt/A 1 7/8"	Percent US 1	Specific Gravity	Maturity 1/	Color 2/	Appearance 3/	French Fries 50° F 5/			French Fries 38° F 5/		
							Shape 4/	Color 6/	Texture 7/	Color 6/	Texture 7/	
CF 7651- 5	265	83	1.071	ME	W	2	RO	6.1	2.3	8.9	2.2	
CF 7666-11	244	87	65	ME	C	3-	R	4.1	2.0	7.8	2.0	
CF76120- 2	344	93	74	E	W	4+	R	4.0	2.0	9.0	2.0	
CF76123- 6	371	95	71	E	CN	4	R	4.5	2.0	8.0	2.0	
CF 7789- 1	363	96	72	E	C	4+	O	6.0	2.1	8.9	2.3	
CF77127- 3	281	87	72	E	CN	4	O	6.7	2.0	8.5	2.0	
- 4	240	84	78	E	R	3-	RO	4.0	2.2	7.4	2.2	
CF77137-32	335	94	67	E	W(N)	4	RO	4.5	2.0	9.0	2.0	
CF77154-10	283	94	73	E	WC	4+	R	3.0	1.8	6.5	2.0	
CF 7829- 4	313	92	75	M	W!	4+	R	6.1	2.0	8.5	2.0	
CF78106- 5	367	94	82	ML	W	4-	R	5.5	2.0	8.2	2.0	
- 8	465	97	80	ME	W!	3+	O	5.0	2.0	8.5	2.0	
CF 7983- 1	397	96	81	ME	W(N)	4+	RO	5.0	2.0	9.5	2.4	
CF79167- 2	381	95	82	ME	LLR	3	RO	3.5	2.3	6.2	2.0	
CF79202- 2	325	88	77	E	R	4+	L	4.5	2.3	9.0	2.5	
CF79210- 3	374	98	79	E	LR	4	O	6.0	2.0	7.9	2.0	
CF79272- 1	396	97	86	M	LR	4+	RO	6.0	2.0	8.5	2.2	
CF79280- 1	404	96	91	ME	W	4	O	6.1	1.9	8.0	2.0	
Katahdin	413	96	79	ML	W	4	R	5.4	2.0	8.0	2.0	
Kennebec	448	97	86	M	W	3+	RO	5.5	2.0	7.9	2.0	
LSD (0.1)	24	2.5	.0032									

1/ - 7/ See footnotes on Maine Table 1.

Maine Table 8. Summary of Campbell medium maturity yield test #1 (107 days), Presque Isle, Maine, 1982

Pedigree	Cwt/A > 1 7/8"	Percent US 1	Specific Gravity	Maturity ^{1/}	Color ^{2/}	Appearance ^{3/}	Shape ^{4/}	French Fries				Boiled ^{8/}			
								50° F 5/	38° F 5/	Texture ^{7/}	Color ^{6/}	Texture ^{7/}	Color ^{3/}	Texture ^{3/}	Flavor ^{3/}
AS 332- 1	363	94	1.081	M	WN	3+	R(O)	5.2	2.0	2.0	5.9	1.0	2.0	3.0	2.5
CS 7232- 4	243	96	74	ME	W	4+	RO, f1	3.5	2.0	2.0	1.9	2.4	3.0	3.0	3.0
CS73105- 2R	408	97	75	ME	LR	3+	O	6.0	2.0	2.0	10.0	2.3	2.0	3.0	2.5
CS 7503-13	465	97	79	ML	WN	4+	O, f1	4.5	2.0	2.0	6.3	2.4	2.0	3.5	3.0
CS 7533-13	412	96	64	E	W	3+	R(O)	3.2	2.0	2.0	6.6	1.1	3.0	3.0	3.0
CS 7543- 2	378	97	83	ME	WN	4+	RO	7.5	2.0	2.0	6.4	1.3	3.5	2.5	3.0
CS 7598- 1R	363	97	81	ME	CN	4	OL	5.0	2.0	2.0	5.9	2.2	3.0	3.5	3.0
CS 7615- 4	453	98	76	L	WC	3+	O, f1	6.5	2.0	2.0	7.2	1.3	2.0	3.0	3.0
CS 7619- 9	400	97	85	M	C	4+	RO	4.5	2.0	2.0	6.3	1.6	2.5	3.0	3.5
CS 7635- 4	478	98	80	L	W	3+	RO	6.4	2.0	2.0	6.4	2.0	2.5	3.0	3.0
CS 7638- 6	364	97	83	ME	W	4+	R	4.6	1.9	1.9	6.5	1.0	2.5	3.0	3.0
CS 7639- 1	457	96	74	E	W	4+	R	7.0	2.0	2.0	9.1	2.0	2.5	3.5	3.0
CS 7685- 5	329	95	69	E	W	4+	R	6.7	2.0	2.0	8.8	2.1	4.0	3.5	3.5
CS 7687- 9	400	95	71	M(E)	DCN	3+	R	6.9	2.0	2.0	9.4	2.5	2.0	3.5	2.5
CS76120- 7	420	95	60	M	WC	3+	R	8.2	2.3	2.0	10.0	2.5	3.0	2.5	2.0
-15	387	97	73	ME	W1	4+	RO	6.1	1.9	1.9	9.6	2.1	3.0	2.0	3.0
CS76123-21	395	95	80	E	CN	5-	R	4.7	2.0	2.0	6.2	1.0	2.5	2.5	2.5
CS76148-18	479	98	66	ME	WN	4	R	6.0	2.0	2.0	9.9	1.7	3.0	3.0	3.0
CS 7712- 6	411	94	70	E	CN	4	RO	7.0	2.0	2.0	9.6	2.4	3.0	4.0	3.0
CS 7757- 3	502	99	84	M	WN	4+	O	5.0	2.0	2.0	6.0	1.7	3.0	3.0	3.0
CS 7778-12	427	97	69	ME	CN	4	R	5.0	2.0	2.0	6.4	2.7	3.5	3.0	3.0
CS 7784-10	375	95	79	E	DCN	4	O	5.4	2.0	2.0	6.2	1.7	3.5	3.5	3.0
CS77118- 4R	396	96	75	E	Re	4+	O	5.6	1.9	1.9	8.1	1.3	3.0	4.0	3.0
Katahdin	412	97	78	M	W	3	R	5.7	2.0	2.0	6.8	1.5	2.5	2.5	3.0
Kennebec	481	98	81	M(L)	W	3	O, f1	5.6	1.9	1.9	5.4	1.9	3.0	3.5	3.0
Mohawk	367	98	87	M(L)	W	3-	O	6.3	2.0	2.0	5.3	1.7	2.5	3.0	3.0
LSD (0.1)	28	1.4	.0022												

1/ - 7/ See footnotes on Maine Table 1.

8/ Tuber plugs boiled ten minutes, then cooled 30 minutes before rating.

Maine Table 9. Summary of Campbell medium maturity yield test #2 (107 days), Presque Isle, Maine, 1982

Pedigree	Cwt/A > 1 7/8"	Percent US 1	Specific Gravity	Maturity ^{1/}	Color ^{2/}	Appearance ^{3/}	Shape ^{4/}	French Fries French Fries						Boiled ^{8/}
								50° F ^{5/}		38° F ^{5/}				
								Color ^{6/}	Texture ^{7/}	Color ^{6/}	Texture ^{7/}	Color ^{3/}	Texture ^{3/}	Flavor ^{3/}
CS77118-19RR	360	95	1.069	E	ReN	4	R(O)	7.0	2.0	9.8	2.0	3.0	3.0	3.0
CS77132-32R	357	95	83	M	R	4	O(L)	4.9	2.0	4.8	2.0	3.0	3.0	3.0
CS 7910- 6	428	98	74	M	W!	4+	R	5.8	3.0	10.0	2.0	3.0	3.0	3.0
-14	396	96	75	ME	W!	4	R	5.0	2.0	8.7	2.1	3.5	3.0	2.5
CS 7920- 7	319	93	73	M	W(N)	3+	R	4.0	2.0	8.0	2.0	3.5	2.5	3.5
-10	281	93	70	ME	WN	4	O	4.5	2.0	9.5	2.2	2.0	2.5	2.5
-18	330	96	84	M	W	4	R	4.0	2.0	8.0	2.0	3.0	3.0	3.5
CS 7963- 2	413	97	84	ME	WN	4	R	4.0	2.6	8.3	2.0	2.5	3.5	3.5
-36	310	94	76	ME	DCN	4	R	4.0	1.8	9.0	2.0	2.0	3.5	2.5
CS 7966-24	364	98	89	M	DCN	4	RO	5.0	2.0	8.2	2.0	3.0	3.0	3.5
CS 7973- 1	446	97	82	ME	R	3+	O	7.5	2.0	10.0	2.0	3.0	3.0	3.0
-10	344	95	83	M	LLR	4+	O	6.5	2.3	10.0	2.0	3.0	3.0	3.0
CS 7981- 7	453	97	79	M	WC	4	O	6.0	2.0	8.1	2.4	3.5	3.5	3.0
CS 7983-12	305	91	74	E	CN	4	R	5.5	1.8	8.8	2.5	4.0	3.0	3.0
-17	355	93	76	E	W	3+	R	5.1	1.9	9.3	2.4	3.5	2.5	3.0
-26	390	95	69	E	W	4-	R	6.7	2.0	10.0	2.5	4.0	2.5	3.0
-34	348	93	80	E	W	4-	R(O)	5.5	1.7	10.0	2.0	3.5	3.0	3.0
CS 7988- 6	383	96	75	ME	CN	4+	RO	5.0	2.3	9.0	2.0	3.0	2.5	3.0
CS 7993- 1	387	96	73	ME	CN	4+	O	5.5	2.0	9.7	2.0	2.5	3.5	3.0
- 3	431	97	80	M	CN	4+	R	7.0	2.0	10.0	2.0	3.0	3.5	2.5
CS79126- 1	440	98	73	ME	Re	4+	R	6.0	2.0	10.0	2.0	3.5	3.0	3.0
CS79228- 1	437	99	73	M(L)	CN	4+	RO	7.0	2.0	10.0	2.0	2.5	2.5	3.0
Long Dormancy	313	99	80	ML	C(N)	4-	R, (fl)	4.0	1.3	5.6	2.0	3.5	3.5	3.0
Katahdin	427	98	78	ML	W	3	R	5.7	2.2	8.5	2.0	2.5	3.5	3.0
Kennebec	461	98	84	M(L)	W!	3+	RO	5.5	2.0	7.9	1.8	2.5	3.5	3.5
Mohawk	391	98	87	ML	W	4-	O, fl	5.5	2.0	7.4	2.0	2.5	4.0	4.0
LSD (0.1)	25.7	1.2	.0025											

1/ - 7/ See footnotes on Maine Table 1.

8/ See footnote on Maine Table 8.

Maine Table 10. Summary of medium-late maturity yield test (115 days), Aroostook Farm, Presque Isle, Maine, 1982

Pedigree	Cwt/A ∇ 1 7/8"	Percent US 1	Specific Gravity	Maturity ^{1/}	Color ^{2/}	Appearance ^{3/}	Shape ^{4/}	French Fries	
								50° F ^{5/}	38° F ^{5/}
								Color ^{6/}	Texture ^{7/}
A 70114- 1	444	96	1.077	M(E)	C(N)	3	R	4.8	2.1
AF 522- 5	429	96	85	M	LR	4	O(L), (f1)	7.0	2.0
CC 06- 5	435	97	81	ME	C(N)	3+	R	4.0	1.9
CD 23- 1	395	95	76	M	WN	3+	R	4.3	1.7
CF77146- 6	460	98	74	M(E)	LLR	4	O	5.3	2.0
CF 7933- 1	489	97	83	ME	DC(N)	4	R	5.5	2.1
CS76121-11	413	98	75	M	WC(N)	4	R(O)	5.2	1.8
CS76123-36	497	96	75	ME	W(N)	4+	RO	7.4	2.0
CS76148-15	413	94	79	M(E)	W	3+	O(R)	4.0	2.0
CS77118-23R	481	98	73	ME	LRpu	3	RO	5.4	2.0
CS 7908- 1	437	97	94	ML	DCN	4	OR	5.0	2.0
CS 7946- 5	453	98	89	ME	W	4-	R	6.1	1.6
CS 7974- 9	485	99	85	L	R	3+	RO	6.4	2.0
CS 7984- 3	470	98	80	M	W	4+	O(R)	4.7	2.0
Katahdin	509	98	79	L	W	3+	R, f1	5.2	2.3
Kennebec	518	99	82	M(L)	W	3-	O, (R)	6.0	1.8
Ontario	564	95	70	LL	W	3-	R	6.3	2.0
Russet Burbank	469	93	83	L	LR	2	L	6.9	2.0
LSD (0.1)	35.3	1.2	.0022						

Maine Table 11. Potato chip test #1, Aroostook Farm, Presque Isle
Maine, 1982 ^{1/}

Pedigree	Storage		
	Temperature (°F)		Average
	45	38 ^{2/}	
AF 222- 1	8.4	8.3	8.4
AF 236- 1	5.4	5.7	5.6
AF 262- 7	7.0	5.5	6.3
AF 299-12	9.1	8.4	8.8
AF 307- 5	8.8	9.9	9.4
AF 324- 1	5.1	4.3	4.7
AF 339- 5	8.5	7.4	8.0
AF 371-66	7.4	8.0	7.7
AF 386-10	7.8	8.4	8.1
AF 431-17	8.0	6.3	7.2
CF 7353- 1	7.8	7.6	7.7
CF74132- 1	8.4	8.2	8.3
CF74135- 3	9.3	9.6	9.5
CF 7508- 1	8.7	8.4	8.6
CF 7608- 9	8.7	9.3	9.0
CF 7615- 4	8.8	10.0	9.4
CF 7646- 3	8.6	9.3	9.0
CF 7651- 5	9.0	8.6	8.8
CF 7666-11	9.8	8.4	9.1
CF76120- 2	8.7	10.0	9.4
CF76123- 6	9.0	9.9	9.5
CF76136-11	7.9	8.3	8.1
CF76183- 2	7.9	7.9	7.9
CF 7719- 6	9.5	10.0	9.8
CF77127- 4	7.8	8.4	8.1
CF77143-10	9.7	9.1	9.4
CF77154-10	5.7	8.0	6.9
CS 7232- 4	4.5	4.5	4.5
CS 7598- 1R	8.1	7.3	7.7
CS 7638- 6	9.2	7.6	8.4
CS76111-12	9.3	8.0	8.7
-14	8.6	7.9	8.3
CS77138-32R	8.1	7.4	7.8
Long Dormancy	5.4	6.5	6.0
Belchip	7.3	6.4	6.9
Kennebec	8.3	8.2	8.3
Monona	6.0	5.1	5.6
Norchip	7.0	6.5	6.8

^{1/} All samples cooked in February. Chip color ratings from National Potato Chip Institute Chart 1206-U, where 1 = very light and 10 = very dark. Each value an average for 20 chips.

^{2/} Tubers reconditioned three weeks at 70° F.

Maine Table 12. Potato chip test #2, Aroostook Farm, Presque Isle, Maine, 1982 ^{1/}

Pedigree	Storage Temperature (°F)								Average
	December				February				
	55	50	45	38 ^{2/}	55	50	45	38 ^{2/}	
AF 186- 5	3.3	4.9	6.8	7.3	3.5	4.3	6.9	6.0	5.4
Allagash Russet	4.0	4.5	5.0	6.3	3.5	4.4	4.7	5.6	4.8
AF 205- 9	3.1	7.7	7.3	7.0	3.8	5.9	7.2	5.3	5.9
AF 330- 1	2.8	4.0	5.3	5.3	3.4	3.3	4.6	4.3	4.1
AS 201-10	5.6	7.4	8.2	9.1	5.5	7.3	7.8	8.3	7.4
CF 7523- 1	7.4	8.5	10.0	10.0	7.6	8.8	9.8	9.4	8.9
CS 7526- 6	4.0	4.5	6.5	6.4	3.3	4.2	6.4	6.9	5.3
CS 7679-26	4.2	5.4	7.5	8.2	3.9	5.5	7.3	6.8	6.1
Belchip	3.5	6.3	7.0	7.0	2.9	5.9	7.1	6.8	5.8
Campbell 11	2.9	5.6	7.1	7.2	3.8	5.5	7.3	7.4	5.9
Chipbelle	4.2	6.1	7.8	5.4	3.7	5.2	6.9	6.1	5.7
Kennebec	6.3	7.2	9.4	9.2	6.2	7.2	8.1	8.5	7.8
Monona	3.0	4.2	6.0	7.0	3.3	2.8	5.9	5.4	4.7
Norchip	3.0	4.2	6.4	7.3	3.8	3.9	6.3	6.5	5.2

^{1/} Chip color ratings from National Potato Chip Institute Chart 1206-U, where 1 = very light and 10 = very dark. Each value an average for 20 chips.

^{2/} Tubers reconditioned three weeks at 70° F.

Maine Table 13. Characteristics of advanced selections from the University of Maine potato breeding program

Pedigree Number	Maturity ^{1/}	Skin Color ^{2/}	Type of tuber ^{3/ 4/}	Yield ability ^{4/}	TGA ^{5/} content ^{4/}	Flavor ^{4/}	Cooked color, table use ^{4/}	Cooked color, French Fries ^{4/}	Texture of French Fries ^{4/}	Percent dry matter ^{4/}	Storage life ^{4/}	Bruising ^{4/}	Virus X	Leafroll	Net necrosis	Late blight	Early blight	Acid scab	Verticillium	Ring rot	Golden nematode	Common scab
AF 205- 9	ML	W	G	G	A	M	M	G	A	G	A	M	R	S	R	S	S	S	S	S	R	S
AF 186- 5	M	W	G	A	A	A	M	G	G	A	A	A	S	S	R	S	S	M	M	S	R	M
CC 26-1a	M	C	G	A	M	A	A	A	G	G	M	G	R	S	R	S	S	S	S	S	S	S
AF 236- 1	ML	C	G	G	G	A	G	E	A	G	F	A	S	S	R	R	M	M	M	S	S	S
CF 7353- 1	ML	Pu	G	G	A	A	G	G	G	A	A	U	S	S	R	S	M	S	R	S	S	S
AF 238-21	ML	W	G	G	G	A	G	A	A	A	M	M	S	S	R	M	S	S	S	S	S	S
CF 7358-14	M	W	G	G	G	A	A	A	A	A	A	M	R	S	R	S	S	M	S	S	R	M
AF 324- 1	E	W	G	U	G	M	U	E	G	G	A	U	S	S	R	S	S	S	S	F	S	S
CF 7523- 1	M	W	G	G	A	G	G	A	G	G	A	A	S	S	R	M	M	S	M	F	R	M
WF 591- 1	M	R	G	G	A	F	M	A	G	G	F	G	S	S	R	S	M	S	M	S	S	S
AF 92- 3	ML	W	G	G	M	M	G	U	M	M	G	M	R	S	R	R	M	R	S	S	S	R
A 70114- 1	M	R	A	G	M	A	G	G	A	G	F	F	S	S	R	S	M	M	M	S	S	R
CF76183- 2*	ME	LR	E	M	A	F	G	G	A	A	G	A	S	S	R	R	S	S	S	F	S	R

Maine Table 13. (continued)

Pedigree Number	Maturity ^{1/}	Skin Color ^{2/}	Type of tuber ^{3/ 4/}	Yield ability ^{4/}	TGA ^{5/} content ^{4/}	Flavor ^{4/}	Cooked color, table use ^{4/}	Cooked color, French Fries ^{4/}	Texture of French Fries ^{4/}	Percent dry matter ^{4/}	Storage life ^{4/}	Bruising ^{4/}	Virus X	Leafroll	Net necrosis	Late blight	Early blight	Acid scab	Verticillium	Ring rot	Golden nematode	Common scab
CF 7679-15	M	C	G	G	A	A	A	M	A	G	G	U	R	S	R	S	S	S	S	R	S	S
CF 7688- 9	M	C	A	G	A	A	M	G	A	G	A	M	S	S	R	S	S	S	S	F	S	S
AF 330- 1	ME	WC	A	A	A	A	A	E	M	G	A	M	S	S	R	M	M	S	M	F	S	S
CF 7608- 9	ME	C	G	A	A	A	G	G	U	M	G	M	R	S	R	S	S	S	S	F	S	M
CF76123- 6	ME	C	G	G	M	F	F	G	G	A	G	U	S	S	R	S	S	S	S	F	S	S
AF 307- 5	M	W	G	G	A	A	A	A	A	M	A	A	S	S	R	R	S	S	S	F	S	S
AF 332- 9	M	B	A	A	A	A	G	M	G	G	G	U	S	S	R	M	M	S	S	F	R	S
AF 299-12	ME	W	A	M	A	A	G	G	G	U	F	U	S	S	R	M	M	M	M	F	S	M
AF 303- 5**	ML	W	G	G	M	U	A	A	M	A	M	E	S	S	R	S	S	S	R	F	S	S
WF 564- 3	M	R	G	G	A	A	M	U	A	M	G	G	R	S	R	R	S	M	S	S	S	R
AF 222- 1	ME	WC	A	M	A	M	A	G	G	A	F	U	S	S	R	S	S	M	S	F	S	R
AS 201-10	E	B	G	G	M	A	G	A	A	A	F	M	F	S	R	R	S	M	M	F	R	S
CF72107-15	M	W	G	A	A	A	G	M	M	A	F	U	S	S	R	R	M	S	S	F	R	S

Maine Table 13. (concluded)

Pedigree Number	Maturity ^{1/}	Skin Color ^{2/}	Type of tuber ^{3/ 4/}	Yield ability ^{4/}	TGA ^{5/} content ^{4/}	Flavor ^{4/}	Cooked color table use ^{4/}	Cooked color, French Fries ^{4/}	Texture of French Fries ^{4/}	Percent dry matter ^{4/}	Storage life ^{4/}	Bruising ^{4/}	Virus X	Leafroll	Net necrosis	Late blight	Early blight	Acid scab	Verticillium	Ring rot	Golden nematode	Common scab
CF74135- 3	E	W	A	A	M	M	E	A	A	U	F	U	S	S	R	S	F	R	S	F	S	M
CF72111- 5	ME	W	G	E	A	G	E	M	M	E	F	A	S	S	R	S	F	S	S	F	S	S
CF 7587- 7	M	B	G	A	A	A	G	M	A	G	F	M	M	M	R	S	F	M	M	F	S	M
CF77154-10	E	C	A	A	G	A	G	G	A	E	F	M	S	S	R	S	S	S	S	F	R	S
AF 262- 7	M	W	G	M	A	G	G	E	A	E	F	A	S	S	R	S	M	S	S	F	S	M
AF 522- 1	M	B	G	E	A	F	F	M	A	G	F	F	S	F	R	S	M	S	M	F	S	M

1/ Maturity: E = early, M = medium, L = late.

2/ Color: R = russet, W = white, B = buff, Pu = purple, C = cream.

3/ Type of tuber includes uniformity of shape, overall appearance, and presence of defects.

4/ Rated as: U = unacceptable, M = marginal, A = acceptable, G = good, E = excellent or F = further testing needed.

5/ TGA = total glycoalkaloids.

Resistance: R = resistant, M = moderately resistant, S = susceptible, F = further testing needed.

* Resistant to virus Y.

**** Resistant to rhizoctonia.**

Maine Table 14. Characteristics of advanced selections from the Campbell potato breeding program

Pedigree Number	Maturity ^{1/}	Skin Color ^{2/}	Type of tuber ^{3/}	Yield ability ^{4/}	TGA ^{5/} content ^{4/}	Flavor ^{4/}	Cooked color, table use ^{4/}	Cooked color, French Fries ^{4/}	Texture of French Fries ^{4/}	Percent dry matter ^{4/}	Storage life ^{4/}	Bruising ^{4/}	Virus X	Leafroll	Net necrosis	Late blight	Early blight	Acid scab	Verticillium	Ring rot	Golden nematode	Common scab
BR 7093-23	ML	W	G	A	M	G	M	G	A	A	A	F	F	S	F	S	M	R	R	F	S	F
BR 7088-18	ML	B	G	A	F	F	F	G	F	G	M	F	F	F	F	R	F	F	R	F	F	F
CS 7232- 4	ME	W	M	M	A	F	F	E	A	G	F	F	S	S	F	S	S	S	S	F	S	M
CS 7490- 2	ME	W	A	G	A	F	F	G	M	M	F	F	S	S	R	S	S	S	S	F	S	S
CS 7697-24	ME	W	A	E	G	F	F	A	A	A	F	F	S	S	R	S	S	S	R	F	S	S
CS 7757- 3	M	W	G	E	G	A	A	A	A	G	F	F	S	S	R	S	S	S	S	S	R	S
CS 7747- 7	E	W	M	E	E	F	F	A	M	G	F	F	S	S	R	S	S	S	S	S	S	S
CS77120- 8	ME	C	E	E	G	A	A	G	A	A	F	F	S	S	R	S	S	S	S	F	S	M
CS 7952- 1	M	W	M	E	A	G	M	G	M	M	F	F	S	F	R	S	S	S	S	F	S	M

1/ Maturity: E = early, M = medium, L = late.

2/ Color: R = russet, W = white, B = buff, Pu = purple, C = cream.

3/ Type of tuber includes uniformity of shape, overall appearance, and presence of defects.

4/ Rated as: U = unacceptable, M = marginal, A = acceptable, G = good, E = excellent or F = further testing needed.

5/ TGA = total glycoalkaloids.

6/ Resistance: R = resistant, M = moderately resistant, S = susceptible, F = further testing needed.

MINNESOTA

F.I. Lauer, D. Wildung, J. Wiersma, G. Rau, M. Burke
and R. Wenkel.

Introduction

This past year, two advanced selections were named. MN 4536 was named Erik, in honor of Erik the Red, the legendary Scandinavian explorer. Erik is primarily a fresh market potato. It appears adapted to the heavier soils of the Red River Valley as well as to the irrigated sands where production for the early market is desired. Table 1 summarizes its characteristics.

Red River Valley Trials

The other selection, MN 8586, was named Agassiz after a glacial lake that once covered much of the Red River Valley. Agassiz is primarily a fresh market potato with acceptable chipping quality as well. Because this russet is highly resistant to hollow heart in the Red River Valley, Agassiz may provide entry to the fresh russet market for RRV growers. Table 2 summarized its characteristics.

Minnesota Table 1. Summary of performance for Erik (MN4536), 1979-1982.

1. Parentage: ND 4524-7 x ND 4620-1.
2. Maturity: Early.
3. Tuber shape: Blocky.
4. Tuber color: Red.
5. Specific gravity: Low.
6. Eating quality: Boiled, good; Baked, fair; French fry, fair.
7. Chipping quality: Poor.
8. Hollow heart resistance: High
9. Disease resistance: Common scab, medium; Late blight immunity gene; Verticillium wilt, low.
10. Area of adaptation: Red River Valley, irrigated sands, early market.
11. Strengths: Early yield, takes wet feet, a rugged selection.
12. Weaknesses: Acts like Pontiac in dry conditions producing few big tubers, color is like Norland.
13. Data: Grand Forks, Baker, and Becker, 1979-1982.

<u>Variety</u>	<u>Maturity</u> ¹	<u>Tuber</u> ² <u>type</u>	<u>Marketable</u> ³ <u>yield</u>	<u>Specific</u> <u>gravity</u>	<u>Hollow</u> ⁴ <u>heart</u>	<u>Early</u> ^{3,5} <u>harvest</u> <u>yield</u>
Norland	2.0	1.9	42.7	1.072	1.33	41.9
Pontiac	4.4	3.3	57.5	1.071	3.17	45.5
MN 4536	2.5	2.2	48.3	1.074	0.33	48.7

- 1/ Scale, 1-6: 1, early; 6, late, RRV data only.
- 2/ Scale, 1-5: 1, good; 5, bad.
- 3/ 20 hill plots, lbs.
- 4/ Number of hollow tubers from 6 per plot.
- 5/ Becker data only.

Foundation and Certified seed available: 70 tons.

Minnesota Table 2. Summary of performance for Agassiz (MN8586), 1979-1982.

1. Parentage: MN 321.64-11 x MN 305.64-1.
2. Maturity: Midseason.
3. Tuber shape: Oval.
4. Tuber color: Russet.
5. Specific gravity: Medium.
6. Eating quality: Boiled, good; Baked, good; French fry, fair.
7. Chipping quality: Excellent.
8. Hollow heart resistance: High.
9. Disease resistance: Common scab, high; Late blight, low; Verticillium wilt, low.
10. Area of adaptation: Red River Valley.
11. Strengths: A russet that can be grown in RRV, handles and stores well.
12. Weaknesses: Low yield, has heavy set and smaller tubers.
13. Data: Grand Forks and Baker, 1979-1982.

Variety	Maturity ¹	Tuber ² type	Marketable ³ yield	Specific gravity	Chipping ⁴		Hollow ⁵ heart
					43°F	65°F	
Norchip	3.5	3.0	38.5	1.090	37	40	0.25
Norgold	3.6	2.3	34.9	1.078	-	-	2.00
Burbank	5.5	4.1	25.4	1.087	-	-	0.13
MN 8586	3.3	2.0	25.3	1.084	35	41	0.00

- 1/ Scale, 1-6: 1, early; 6, late.
- 2/ Scale, 1-5: 1, good; 5, bad.
- 3/ 20 hill plots, lbs.
- 4/ Chip color values of 35 or more are acceptable.
- 5/ Number of hollow tubers from 6 plot.

Foundation and Certified seed available: 140 tons.

NEBRASKA

R. B. O'Keefe, Eric D. Kerr, Arthur Hagen

Seedling and Variety Screening. Approximately 7000 first year seedlings were grown in 1982 from which 67 selections were made. Twenty-eight 1981 selections (3 kg each) were placed in three commercial storages for longtime chip quality evaluation; selections that were equal to Norchip were Neb. 125.78-2, BN9803-1, BN9805-2, BN9803-3, BN9855-5, BN9815-3 and BN9804-2. Interstate cooperative trials were continued in Nebraska, Colorado, and Arizona; superior selections were: Whites - Neb. 12.782-2, Crystal, Chipbelle, BN-9855-6; Reds - Neb. 143-70-2, Neb. A131-4; Russets - Neb. A69.72-1.

Performance Of Clonal Strains. Clonal strains of Monona, Norchip, Dark Red Norland and Norgold developed from stem cuttings were compared for differences in yield and quality. All clones tested were free from visible virus and PVX. Significant differences in yield, grade defects and specific gravity were noted among clones within varieties.

Potatoes As An Energy Resource. Yield, quality, and ethanol production from potatoes grown with three levels of pest control were continued. Insect populations were 50 percent higher with "standard" control and 500 percent higher in the "no control" plots than with "complete control". Ethanol production ranged from 75 to 110 L/t. The average yield of potatoes was reduced by 59 percent in the no control plots; also the grade quality of potatoes was reduced by 55 percent. There were no differences between the complete control and standard control treatments. However, there were cultivar by control level interactions, i.e., cultivars expressed variability in responses to insect and disease (*Alternaria solani*) stresses and levels of control. Seed samples for each cultivar and treatment were planted in Arizona during the winter for disease evaluations. Virus and mycoplasma diseases were more prevalent in plants produced from the standard control than from the complete control samples. These insect transmitted diseases were most prevalent from the "no control" sample. Results were as follows:

	<u>Complete</u> <u>Control</u> %	<u>Standard</u> <u>Control</u> %	<u>No</u> <u>Control</u> %
Sterile	9.8	18.1	27.9
Hairsprout	1.4	0.7	2.0
Haywire	2.0	1.6	8.9
PLRV	0.7	0.2	4.3
Mosaic	3.4	2.5	1.1
Weak	2.7	5.9	5.5
Aster Yellow	0.7	0	3.4

Tubers (50) were obtained from nine 1981 crop commercial seed lots for greenhouse indexing and field evaluation for sterile tubers, hairsprout and haywire. No haywire was identified but hairsprout and sterile tubers ranged from 4 to 36 percent in the greenhouse tests. The seed tubers were then planted in tuber-units for field evaluation at Scottsbluff in 1982. No haywire and less than 2 percent hairsprout and sterile tubers were noted.

Processing Studies. Samples of four standard potato varieties and 13 advanced selections were obtained from 13 locations in the North Central region and Canada in 1981.

The relationship of sucrose content (SR rating) at harvest time to longtime chipability was studied for the fifth year. The average sucrose content of the cultivars was lower than in 1977 through 1980. The average color of chips after 6 months of storage in 1978 through 1981 was not correlated with average SR rating nor was SR rating correlated with vine maturity in any of the years. Glucose contents after longtime storage were not correlated with SR ratings nor vine maturity, but were highly correlated with chip color after 6 months storage in all years (Nebraska Tables 1 and 2).

Protein contents of tubers in 1981 were lower than in previous years and ranged from 2.65 to 4.68 percent. Protein content was not correlated with SR ratings or vine maturity in any of the years.

The analyses and study of the correlations of yield and quality factors with climatic conditions and cultural practices is progressing. The climatic conditions include maximum, minimum, average and departure from normal temperatures and growing degree days. The cultural factors of fertilizer levels and plant spacing are considered.

Nebraska Table 1. Chip color sugar and protein contents of potatoes in the NCS Trials 1981.

Selection	Vine Maturity	Sucrose (1)**	PCII* (1)**	PCII* (3) ^{1/}	PCII* (6)	Glucose (6)	Protein
		mg/g	Averages for 13 locations			(%) ^{2/}	(%) ^{3/}
Red Pontiac	3.7	2.91	6.0	7.1	6.7	1.07	3.95
Rus Burbank	4.1	2.30	4.4	4.9	4.8	0.60	2.98
NE A129.69-1	4.3	2.21	4.6	4.3	3.8	0.45	4.57
MN 9781	2.9	2.07	3.8	5.5	5.5	0.72	2.88
NC 146-4R	1.7	1.99	3.2	5.5	5.2	0.78	3.39
MN 10162	3.4	1.73	3.2	3.0	3.4	0.22	4.29
Wisc. 774R	3.1	1.68	5.3	6.5	7.2	1.02	2.78
Norchip	2.8	1.67	3.5	3.7	4.4	0.43	4.21
Norland	1.5	1.60	4.6	7.0	5.5	0.86	4.55
ND 55-7	2.7	1.59	3.2	5.2	5.1	0.68	4.30
La. 7196	3.7	1.57	4.9	6.5	5.4	0.96	2.51
La. 32-124	3.2	1.46	4.4	6.5	5.8	0.81	3.04
ND 119-3	2.4	1.37	3.2	4.8	5.5	0.80	4.41
MN 8777	3.8	1.34	4.7	6.2	6.1	0.85	2.65
NE 7.67-1	2.6	1.26	4.6	6.4	7.1	1.15	4.17
NE A219.70-3	3.9	1.25	4.2	6.1	5.7	0.89	4.39
Wisc. 726	<u>3.3</u>	<u>0.90</u>	<u>3.3</u>	<u>4.8</u>	<u>4.0</u>	<u>0.42</u>	<u>4.68</u>
Ave.	3.1	1.70	4.2	5.5	5.4	0.75	3.75
Correlation with Sucrose:	0.206	----	0.414	0.629	0.023	0.029	0.176

* PCII Chip Color = 1 to 10 scale.

** Number in parentheses = approximate number months after harvest.

1/ Treated with Fusarex.

2/ Correlation with Maturity = 0.171; correlation with PCII (6) = 0.946**.

3/ Correlation with maturity = 0.206.

Nebraska Table 2. Chip color sugar and protein contents of potatoes from various locations 1981.

Location	Days to Harvest	Sucrose (1)**	PCII* (1)**	PCII* (3) ^{1/}	PCII* (6) ^{2/}	Glucose (6)	Protein ^{3/}
		mg/g	Averages for 17 selections			(%)	(%)
Louisiana	100	9.82	3.1	3.3	4.9	0.60	4.66
Missouri	143	3.69	3.8	6.1	7.6	1.03	4.66
Iowa	112	1.42	4.6	6.3	7.4	0.98	4.18
Kentucky	164	1.14	6.1	5.4	6.1	0.92	3.58
Nebraska	116	1.10	3.2	5.3	3.8	0.64	3.44
Alberta	132	1.07	4.1	4.8	3.6	0.46	4.87
North Dakota	132	1.06	4.2	6.2	4.6	0.61	3.01
Michigan	146	1.01	2.9	6.2	4.8	0.62	4.21
Manitoba	127	0.75	4.5	5.4	4.5	0.55	2.98
Indiana	135	0.64	3.4	6.2	4.4	0.69	2.87
South Dakota	141	0.57	3.9	4.7	5.9	0.93	4.39
Wisconsin	146	0.43	4.3	6.2	4.9	0.76	3.83
Minnesota	<u>114</u>	<u>0.41</u>	<u>6.2</u>	<u>5.6</u>	<u>6.8</u>	<u>1.05</u>	<u>3.77</u>
Ave.	131	1.70	4.2	5.5	5.4	0.75	3.75
Correlation with Sucrose:	0.472	----	0.353	0.725**	0.066	0.924**	0.318

* PCII Chip Color = 1 to 10 scale.

** Numbers in parentheses = approximate number of months after harvest.

1/ Treated with fusarex.

2/ Correlation with glucose (%) = 0.925**.

3/ Correlation with Days to Harvest = 0.107.

Indexing of Seed stocks. Five tubers of each of 34 varieties and selections were indexed in the greenhouse and in Arizona. ELISA tests were used to identify PLRV, PVS, PVM, PVY and PVA. Tomato tests and PAGE were used to identify PSTV. The Agdia Kits were compared with Dr. Ball's ELISA procedures. Microprecipatin and latex agglutination were compared with ELISA.

Results were similar for both greenhouse and field grown plants. The Agdia Kits were simple to use and results compared favorably with standard ELISA procedures. Latex agglutination was superior to microprecipatin tests.

ELISA TEST KIT RESULTS

	<u>Positive</u> %	<u>Negative</u> %
<u>PVX</u>		
GH	55	45
Field	52	48
<hr/>		
<u>PLRV</u>		
GH	8	92
Field	8	92
<hr/>		
<u>PVY</u>		
GH	0	100
Field	3	97
<hr/>		
<u>PVA</u>		
GH	0	100
Field	8	92
<hr/>		
<u>PVM</u>		
GH	0	100
Field	8	92
<hr/>		
<u>PVS</u>		
GH	82	18
Field	83	17
<hr/>		

NEW YORK-LONG ISLAND

J. B. Sieczka, R. C. Neese and D. D. Moyer

Results of Potato Variety Trials, 1982

General Information. There were 63 entries included in four replicated experiments conducted at the Long Island Horticultural Research Lab (LIHRL) at Riverhead, New York and in an experiment conducted on the South Fork of Long Island. Also, 109 clones, mostly golden nematode (GN) resistant, were observed in two non-replicated trials planted at the LIHRL. The effect of nitrogen rate on the yield and quality of newly released GN resistant varieties and promising GN resistant selections was evaluated in two experiments at the LIHRL. The soils at both locations are well drained, however the soil at the Riverhead site has less organic matter and a lower water holding capacity than the one at the South Fork location. Rainfall distribution was erratic this year.

North Fork. In the early variety experiment all entries except Oceana yielded more than Superior (See Table 1). Tubers of Oceana, B7805-1 and Campbell 13 had the highest appearance ratings. Internal defects were most severe in B7805-1 tubers. In the Main Season I experiment, Belchip, Hudson, Wauseon, C7523-1, NY63 and NY67 produced marketable yields equal to or greater than Katahdin (See Table 2). Chipbelle had the highest specific gravity. Some amount of internal defects were present in all lines except Rosa. Clones which appear to be especially susceptible are Belchip, Campbell 11, Wauseon, Simcoe, and CF72107-15. In Main Season II, marketable yield of Katahdin was not significantly different from Belchip, Chipbelle, AF236-1, B9580-3, B9581-10 or F7300-8 (see Table 3).

South Fork. The yield and quality of certain lines grown on the South Fork differed substantially from their performance at Riverhead (see Table 4). Marketable yields of Campbell 11, Rosa, Wauseon, and C7358-14 were considerably lower. Hudson Katahdin and Superior yields on the other hand were higher. Hudson tubers were larger with 16 percent of the total yield being greater than four inches in diameter. A perfect appearance score was given to B7805-1, however, 36 of the 40 tubers cut had major internal defects. Unfortunately, internal defects were observed in all lines tested.

Russet. BelRus was the lowest yielding and the nicest appearing entry in the russet experiment at Riverhead (see Table 5). The highest yielding line was Acadia Russet. This clone produced attractive tubers which were relatively large in size. Lemhi yielded well and had the highest specific gravity but was plagued with a high percentage of internal necrosis.

Long Island Table 1. Early Potato Variety Trials Results - Riverhead, New York 1982.

1/ Clone	Yield (cwt/A)		% of Sup 1-7/8-4	% of Total		3/ Spec/ Grav.	4/ App.	Int Def ^{5/}			Vine ^{6/} Mat	Comments ^{7/}	Tuber Data ^{8/}				
	Total	US No. 1 1-7/8-4		1-7/8-4	4			Def ^{2/}	IH	BC			Int	Col.	Tex.	Shape	Depth
Campbell 13	469	402	133	86	2	2	81	8.1	4	0	0	3.5	Len	W	S	O-R	SF
Oceana	303	246	81	81	2	0	71	8.5	0	0	0	1.3	Sm	W	R-R	O-R	SF
Superior	393	302	100	77	0	2	79	7.0	0	0	0	1.5		Bu	S N	R	SF
B7805-1	438	373	124	85	3	4	73	8.3	6	11	13	4.0		W	S	O	R
N'68	385	313	104	81	0	3	73	6.5	0	0	0	2.3	Sk	W	S	R	MT
T11-29	498	380	126	76	0	4	80	6.7	0	0	0	2.8	Sm, Irr, Kn	W	RS	O-R	MT
T20-5	591	522	172	88	0	3	73	6.8	0	0	0	7.5	S1 irr	Bu	SN	R	R
T30-36	538	448	148	83	0	1	74	6.8	0	0	0	4.5	S1 irr	Bu	SN	R	R
T37-29	526	450	149	86	0	1	77	7.8	0	0	0	4.3	S1 irr	W	S	R	R
T88-6	398	327	107	82	0	1	72	7.2	0	0	0	1.5	Sp	W	RS	O	M
Waller-Duncan	(43)	(43)					(04)										

1/ Planted April 14, 1982, vine killed September 9, 1982, harvested September 21, 1982. Within row spacing 9.3". Fertilizer applied at a rate of 1200 lb/A of 10-20-10-4 (MgO) in bands at time of planting, 60 lbs of N sidedressed. Plot size 2 rows x 12 feet, 4 replications.

2/ Defects = Total of all defects.

3/ Specific gravity determined by hydrometer. 1.0 omitted.

4/ Appearance rated on a scale of 1 to 9; 1 = extremely rough, unattractive, 9 = smooth, attractive.

5/ Number of tubers with hollow heart, brown center or internal necrosis of 40 tubers cut (10 per replication).

6/ Vine maturity rated on August 19, 1982 on a scale of 1 to 9, 1 = completely dead, 9 = green and vigorous.

7/ Comment abbreviations. Irr = irregular, Sl irr = slightly irregular, Sm = small, med = medium, Sk = skinned, SE = shallow eyes, P = pink, HS = heat sprouts, CT = chain tubers, DAE = deep apical eyes, MDAE = moderate deep apical eyes, Att = attractive, Len = prominent lenticels, St = stolons, Sp = sprouts, Kn = knobs, Mix = varietal mix, BS = black spot.

8/ Color - B=Brown, BR=bright red, Bu=buff, BW=bright white, MR=medium red, P=pink, Pu=purple, W=white.

Texture - HR=heavy russet, MR=medium russet, RS=relatively smooth, SN=slight net, S=smooth.

Shape - O=oblong, L=long, R=round.

Depth - F=flat, MT=medium thick, R=round, SF=slightly flattened.

Long Island Table 2. Main Season 1, Riverhead, New York 1982.

Clone 1/	Yield (cwt/A)		% Kat Yield 1-7/8-4	% of Total 1-7/8-4	Def 2/	Spec 3/ Grav.	App 4/	Int Def 5/		Vine 6/ Mat	Comments 7/	Col.	Tuber Data 8/	
	Total	US No. 1 1-7/8-4						HH	BC				Tex.	Shape
Belchip	530	485	112	92	0	1	85	2	0	8	Irr	Bu	SN	O-R
Campbell 11	430	381	88	88	1	2	87	5	1	1		Bu	SN	R-O
Chipbelle	437	371	85	85	0	1	98	3	0	0	Sl irr	Bu	SN	0
Hudson	541	487	112	90	3	1	77	6.8	0	3	MDAE, Lg, Sl irr	Bu	RS	R-O
Katahdin	498	434	100	87	0	1	80	7.2	0	1	Sl irr	W	RS	R-O
Rosa	394	305	70	77	0	2	62	7.2	0	0	Sl irr, Sk	WP	S	R-O
Wauseon	474	434	100	92	0	1	79	7.0	4	2	Sl irr, MDAE	Bu	RS	R-O
AF-186-5	460	372	87	81	1	1	83	7.0	2	3	Sp, Irr	Bu	SN	0
AF-205-9	411	319	73	78	0	0	87	8.5	2	0	Sm, SE, BS	Bu	SN	O-R
C7358-14	459	397	92	87	0	1	70	7.5	3	2	BS, Sm, Sl irr	Bu	SN	O-R
CF7523-1	605	503	116	83	1	1	79	8.0	0	1	Sm, CT	W	RS	R
Simcoe	362	316	73	87	0	1	82	7.8	3	3	Sm, SE	W	RS	R
NY-63	551	491	113	89	2	1	75	8.2	0	0	Sl lent	W	S	R
NY-67	517	457	105	88	1	1	75	7.2	0	1	Sk, lent	W	RS	R-O
CF72107-15	389	341	79	86	0	1	72	7.2	3	0	Sk, P buds	W	RS	R
Waller Duncan	(62)	(66)												

1/ Planted April 16, 1982, vine killed September 9, 1982, harvested September 21, 1982. See footnote 1/, Table 1.

2/-8/ See appropriate footnotes in Table 1.

5/ Rated August 31, 1982.

Long Island Table 3. Main Season II, Riverhead, New York 1982.

Clone 1/	Yield (cwt/A)		% Kat Yield 1-7/8-4	% of Total		Spec ^{3/} Grav.	4/ App.	Int Def ^{5/}		Vine ^{6/} Mat	7/ Comments	Tuber Data ^{8/}			Depth	
	Total	US No. 1 1-7/8-4		1-7/8-4	Def			2/ Def	Int			BC	HH	Col.		Tex.	Shape
Belchip	509	449	96	88	3	87	6.0	1	0	0	4.5	Irr	W	RS	0	F
Chipbelle	524	458	98	87	3	97	7.5	0	0	0	4.5	Sl irr	Bu	SN	0	SF
Katahdin	578	469	100	81	9	78	7.2	0	0	0	6.3	Sl irr, Sk	W	RS-S	R-0	MT
Rosa	462	361	77	78	5	78	7.0	0	0	0	5.5	Irr, Sk	W-P	S	R	MT
AF201-10	377	296	63	79	0	74	8.0	1	0	0	1.0	Sm	Bu	RS	O-R	MT
AF236-1	548	430	92	78	8	85	7.8	0	0	0	6.0	Sk	Bu	RS	0	SF
AF332-9	452	382	81	85	7	77	7.0	0	0	1	2.8	Sl irr	Bu	SN	O-R	MT
B9527-1	401	270	58	67	21	82	5.0	1	0	15	1.5	Kn, P buds	W	S	0	MT
B9580-3	477	392	84	82	2	82	7.2	7	1	3	1.5	Sl irr	Bu	SN	0	MT
B9581-1	430	336	72	78	3	82	6.8	0	0	0	2.0	Sl, Kn	Bu	SN	0	MT
B9581-10	613	518	110	85	2	82	7.0	2	0	4	2.8		T-Bu	SN	R	MT
B9602-14	395	315	67	80	2	73	7.0	5	4	1	1.8	Sm	Bu	SN	R	R
B9642-5	445	384	82	86	3	84	8.2	5	2	1	1.3	Sm	W	S	R	MT
F7300-8	570	429	91	75	9	87	5.2	0	0	0	9.0	Irr, CT, HS	Bu	SN	0	MT
NY69	495	382	81	77	3	65	8.0	1	0	0	1.0	P buds	Bu	N	0	MT
Waller-Duncan	(.05)	(71)				(03)										

1/ Planted April 15, 1982, vine killed September 9, 1982, harvested September 20, 1982. Plot size 1 row x 20 feet, 4 replications.
See footnote 1, Table 1.

2/ - 8/ See appropriate footnotes in Table 1.

5/ Rated August 31, 1982.

Long Island Table 4. South Fork Experiment, Wainwright, New York, 1982.

Clone 1/	Yield (cwt/A)		% Kat Yield 1-7/8-4	% of Total 1-7/8-4		Def 2/ App 3/	Int Def 4/		Vine 5/ Mat	Comments 6/	Tuber Data 7/				
	Total	US No. 1 1-7/8-4		4	> 4		IH	BC			Col.	Tex.	Shape	Depth	
Belchip	583	502	104	86	0	3	22	0	5	5.3	Irr, DAE	W	SN	0	F
Campbell 11	263	212	44	81	0	1	9	5	3	1.0	Small	Bu	SN	R	MT
Chipbelle	441	386	80	88	0	2	27*	0	0	5.0	*Rot present	Bu	N	0	SF
Hudson	608	468	97	77	16	5	0	16	5	4.3	Big, Irr	Bu	RS	R	SF
Katahdin	535	482	100	90	0	2	2	8	0	3.0		W	RS	R-0	MT
Rosa	394	286	59	73	0	6	7	0	9	2.8	Small	W-P	S	R	MT
Superior	479	421	87	88	0	0	1	5	5	1.0	Small	Bu	SN	R	MT
Wauseon	292	236	49	81	0	2	2	7	0	1.0	Small	Bu	SN	R	MT
AF186-5	476	381	79	80	0	6	14	0	3	4.0	Med	Bu	SN	0	SF
AF205-9	466	374	78	80	0	3	9	2	2	2.3	Small	Bu	RS	0	MT
B7805-1	486	410	85	84	5	7	2	33	1	1.0	Att	W	S	0	MT
C7358-14	400	337	70	84	0	4	11	4	3	1.0		Bu	RS	O-R	MT
NY63	544	475	99	87	1	3	7	1	5	3.3	Len	W	RS	R	MT
NY67	509	439	91	86	0	2	0	2	2	6.5	Len, SI irr	W	RS	R	MT
NY68	367	310	64	84	1	4	1	0	11	1.0	Small	W	RS	R-0	SF
Waller Duncan (.05) (68) (64)															
Non-replicated															
Acadia Russet	455	413	86	93	0	0	0	0	1	-	Large	T	MR	L-0	SF
Campbell 13	349	305	63	87	0	3	0	3	0	1.0	Small, Len	BW	S	R	MT
Lemhi	583	468	97	80	0	0	0	0	4	-		Br	MR	L-0	SF
Oceana	317	262	54	83	0	6	0	2	0	1.0	Irr	W	S	R	SF
Russette	442	391	81	88	0	3	0	0	1	-	Small	B	MR	0	SF
AF201-10	327	256	53	78	2	0	0	0	0	1.0		Bu	S	O-R	MT
B8972-1	228	125	26	55	0	10	3	0	2	-	Small, mix	B	PR	0	MT
NY69	485	424	79	87	0	3	3	1	0	1.0	P. buds	Bu	N	0	MT

1/ Planted April 23, 1982, harvested October 6, 1982, within row spacing 9 inches. Fertilizer applied at rate of 2200 lb/A of 8-16-8. Four replications.

2-7/ See appropriate footnotes in Table 1.

4/ Numerals below dotted line refer to number of tubers with internal defects out of 10 cut.

5/ Rated 9/15.

Long Island Table 5 . Russet Variety Trial, Riverhead, New York 1982

Clone 1/	Yield (cwt/A)				BelRus 4-16 oz	% of Total				Spec ^{3/} Grav	App ^{4/}	Int Def ^{5/}			Comments ^{6/}	Tuber Data ^{7/}			
	US No. 1					Def ^{2/}	10-16	4-10	16			Int	BC	Int		Col.	Tex.	Shape	
	Total	4-10 oz	10-16 oz																
Acadia Russet	549	396	88	310	9	72	16	1	2	81	8.2	0	0	.3	Nice	B	MR	L	SF
BelRus	252	155	2	100	33	65	1	1	0	83	8.5	0	1	.0	OK	B	HR	L	SF
Lemhi	560	398	21	268	22	71	4	0	3	90	6.8	1	0	24	Sl irr	B	MR	L-0	MT
R. Burbank	516	259	12	173	18	50	2	0	30	87	5.2	1	0	8	Irr, Kn	B	MR	L	SF
Russette	434	313	51	233	12	72	12	2	2	88	7.5	0	1	0	Irr, Sm	B	MR	0-L	SF
B8972-1	309	187	8	125	31	61	3	0	5	77	7.8	2	0	9	SE, Sm	B	MR	L	R
BR7093-23	567	407	78	310	11	73	14	0	2	80	8.8	0	0	0	Nice	BW	S	R-0	R
B9651-1	391	274	39	200	13	70	10	1	6	85	7.8	0	9	13	Sl irr	B	MR	L	MT
Waller Duncan (.05)	(76)	(61)	(29)							(02)									

1/ Planted April 15, 1982, harvested September 22, 1982. See footnote 1 Table 1.

2/ - 7/ See appropriate footnotes in Table 1.

Table 6. Effect of nitrogen rate on yield and quality of Belchip, Chipbelle, Wauseon and Rosa.

Clone and N ^{1/} rate (lb/A)	Yield (cwt/A)		% of Total 1-7/8-4	Spec. ^{2/} Grav.	App. ^{3/}
	Total	1-7/8-4			
<u>Belchip</u>					
75	294	255	87	81	7.3
125	365	326	89	83	6.8
175	372	341	92	83	7.0
225	371	333	90	83	6.3
<u>Chipbelle</u>					
75	293	234	80	95	6.8
125	334	275	82	97	6.3
175	390	321	82	99	7.0
225	375	314	84	98	7.3
<u>Wauseon</u>					
75	256	215	84	69	7.0
125	302	260	86	71	7.0
175	358	316	88	72	7.0
225	333	290	87	74	7.0
<u>Rosa</u>					
75	248	181	73	76	6.8
125	276	203	74	77	6.8
175	348	285	82	76	6.0
225	268	213	79	78	6.5

1/ Planted May 4, 1982, vine killed September 15, 1982, harvested September 15, 1982. Plot size 4 rows x 30 feet, data collected from center 2 rows x 25'. Split plot design, 4 replications. All plots received 300 lb/A P₂O₅, 150/A lb K₂O and 50 lb/A MgO at planting. Nitrogen rates listed applied at time of planting. Sidedress nitrogen was applied at a rate of 30 lb N/A on June 10, 1982 because of leaching rains in early June.

2/-3/ See appropriate footnotes Table 1.

Table 7. Effect of nitrogen rate on yield and quality of C7358-14A, CF7523-1, NY63 and NY68.

Clone and N ^{1/} rate (lb/A)	Yield (cwt/A)		% of Total 1-7/8-4	Spec. ^{2/} Grav.	App. ^{3/}
	Total	1-7/8-4			
<u>C7358-14A</u>					
100	300	249	83	73	7.5
150	292	243	83	74	7.3
200	324	279	86	75	7.3
<u>CF7523-1</u>					
100	379	296	78	79	7.3
150	366	285	78	80	7.0
200	422	356	84	82	7.3
<u>NY63</u>					
100	357	319	89	77	7.0
150	379	340	90	77	7.8
200	381	343	90	78	7.3
<u>NY68</u>					
100	263	217	83	76	6.3
150	261	220	84	76	7.0
200	276	239	87	77	7.0

Guard Rows (Replicated)					
<u>AF186-5</u>					
100	357	296	83	83	7.3
150	388	330	85	84	7.8
200	407	355	87	85	7.3
<u>NY67</u>					
100	378	339	90	79	7.0
150	423	387	91	80	7.0
200	449	407	91	81	7.0

1/ See footnote 1, Table 6.

2/-3/ See appropriate footnotes Table 1.

Table 6. Results of observation trials, Riverhead, New York-1982.

Clone/ US No. 1	Yield (wt/A)		% of Total Yield		% of 1-7/8-4		Yield of		Spec. 3/ Grav.	App. 4/ HH	Int Def 5/ EC Int		Comments		Col.	Tuber Data 7/ Tex. Shape		Depth
	Total	1-7/8-4	1-7/8-4	Def 7/8	1-7/8-4	Yat	Sup	Sub										
Katahdin	502	408	81	3	100	129	76	8	8	0	0	0			W	RS	R-O	SF
Superior	388	298	77	1	77	100	79	7	7	0	0	0	Sm		W	RS	R	MT
B6682-4	338	219	65	0	67	87	84	7	7	0	0	0	Sm		EW	RS	R-O	MT
B6682-7	328	258	79	3	65	85	87	7	7	0	0	0	OK		EW	SN	O-R	MT
B6687-2	323	273	71	4	76	99	82	7	7	5	0	0	Yellow		EW	RS	R-O	MT
B6687-4	432	303	70	3	86	111	82	7	7	0	1	0	Yellow, Sp		EW	RS	O	SF
B6687-13	373	283	76	1	74	96	77	8	8	2	0	0	Len		W	S	R-O	SF
B6687-23	482	403	84	1	96	124	83	7	7	0	0	0	Yellow, DAE		W	RS	O-R	MT
B6687-25	507	413	81	2	101	131	95	7	7	2	0	0	SP, CT		W	S	O	MT
B6687-31	467	398	85	1	93	120	80	8	8	4	0	0	Yellow, Sm		W	RS	R	R
B6706-15	408	348	85	0	81	105	86	7	7	1	1	0			EW	SN	R	MT
B9510-2	472	358	76	2	94	122	74	8	8	1	2	0	OK		W	S	O	MT
B9510-17	288	179	62	0	57	74	85	7	7	0	0	0			W	RS	R	SF
B9536-33	577	492	85	1	115	149	80	8	8	0	0	1			W	SN	R	MT
B9538-6	343	239	70	3	68	88	64	7	7	6	4	0	Sm		B	HR	O	MT
B9540-53	427	308	72	1	85	110	71	7	7	1	4	0			B	MR	O-L	MT
B9540-62	457	308	67	5	91	118	71	8	8	0	0	0	SE		B	LR	L-O	MT
B9541-44	373	313	84	0	74	96	74	8	8	0	0	0	Sm, Med		BW	SN	R	R
B9545-42	383	249	65	0	76	99	71	9	9	0	0	0	SE, Att		B	HR	L	SF
B9638-11	527	432	82	3	105	136	89	7	7	2	0	0			BW	RS	O-R	MT
B9715-2	408	234	57	2	81	105	72	7	7	0	0	0			B	MR	O-L	MT
B9717-4	457	283	62	3	91	118	72	8	8	0	0	0			B	MR	L	MT
B9719-5	447	323	72	2	89	115	74	7	7	0	0	0			T	PR	O-L	MT
B9720-3	492	333	68	1	98	127	76	8	8	0	0	0			B	MR	O	R
B9724-17	447	308	69	2	89	115	67	8	8	2	0	0	Sl irr		T	MR	L-O	R
B9742-1	338	244	72	3	67	87	68	7	7	2	0	0			B	MR	L	MT
B9750-1	343	139	41	3	68	88	70	8	8	0	0	0			B	MR	L	MT
B9762-11	398	278	70	4	79	103	80	8	8	4	0	0	Sl irr		T	MR	L-O	F
B9767-20	313	174	56	2	62	81	72	7	7	1	0	0			T	MR	O-L	MT
B9774-5	422	333	79	6	84	109	69	7	7	0	0	1	Sl irr, Kn		W	VS	O-R	MT
B9781-5	393	333	85	1	78	101	74	8	8	0	0	0			BW	SN	R-O	MT
B9781-12	338	239	71	1	67	87	71	8	8	0	0	0	SE, Sm		W	RS	O-R	SF
B9792-16	532	422	79	2	106	137	90	7	7	0	0	0	Sl irr		W	SN	R-O	MT
B9792-34	432	293	73	10	80	104	78	8	8	0	0	0			W	RS	O-R	SF
B9792-13	534	435	81	3	107	146	89	7	7	0	0	0	Sl irr, Len		W	SN	O	MT
B9792-49	559	534	96	2	130	179	81	8	8	0	2	0			W	SN	R-O	MT
BH7093-23	492	368	75	5	98	127	72	8	8	0	0	0			W	RS	O-R	MT
HR8757	477	442	93	0	95	123	62	7	7	0	3	0			R	S	O-R	SF

1/ Planted April 16, 1982, vine killed August 26, 1982, harvested September 8, 1982. See footnote 1, Table 1.

2/-7/ See appropriate footnotes Table 1.

Table 9. Information on rejected lines in observational trials, Riverhead, New York-1982.

Clone	Comments	Tuber Data				Clone	Comments	Color	Tuber Data			
		Color	Tex.	Shape	Depth				Color	Tex.	Shape	Depth
87151-4	Irr, Late, Sp	Bu	SN	R-O	MT	7	89723-3	Poor yield	T	MR	O	MT
88684-3	Sm, DE	W	S	O-R	MT	6	89724-5	Kn, Irr	W	VS	O	F
88684-1	Sm, GC	Bu	SN	O-R	MT	7	89724-9	Heavy set, Sm, SE	T	MR	O	R
88684-13	Kn, Pinkeye	Bu	SN	R	R	5	89729-2	Poor yield	T	HR	O	SF
88684-16	Sm	W	S	R	SF	6	89732-2	Spindle, SE	T	LR	L	R
88687-14	Sp, Len, Irr	W	RS	R-O	MT	7	89733-2	Sm, Poor yield	B	FR	L	R
88687-16	Irr	W	RS	O-R	F	6	89735-1	Sm, Poor yield	B	MR	L-O	MT
88687-19	Sm, Yellow	W	S	R	R	5	89735-6	Sm, Poor yield	B	HR	L	R
88687-29	Yellow	Y	RS	R	MT	8	89735-8	Irr, Poor yield	B	HR	L	MT
89518-3	Variable	W	RS	O-R	SF	7	89737-1	Kn	T	FR	O	MT
89538-9	Irr, Kn, Int	B	MR	O	MT	7	89738-3	Sm	R	R	L-O	R
89540-25	Variable	T	FR	L-O	MT	6	89738-4	Spindle, Irr	T	FR	L	SF
89544-9	Kn	B	FR	O	MT	6	89740-1	GC, Kn	R	HR	L	F
89598-5	Poor yield, Sm	W	RS	R	R	6	89740-8	Sm	B	HR	O-L	MT
89677-4	Irr, CT, Sp	W	S	R	R	5	89742-7	Sm, Kn	R	MR	L	SF
89677-5	Sm	BW	S	R	R	7	89742-15	Irr	R	FR	L-O	SF
89677-6	Sm, Kn	BW	S	R	R	7	89744-1	Irr, Sm	R	MR	O	MT
89682-4	Yellow	Y	S	R	R	8	89752-3	Sm, Irr	T	LR	L	MT
89682-5	DE, Irr, Kn, GC	Bu	RS	R	MT	5	89752-7	V Sm, Ugly	-	-	-	-
89686-5	GC	W	RS	R-O	MT	5	89755-4	V Sm	B	MR	L-O	MT
89689-7	Yellow, Sp	Bu	RS	R	R	7	89761-1	Kn	B	HR	L-O	MT
89690-6	Irr, DE, Sm, Yellow	BW	SN	R	MT	6	89762-5	Sm, Poor yield	B	MR	O	SF
89696-1	Spindle	W	RS	O	MT	7	89765-3	Sm, Poor yield	T	MR	O	MT
89703-4	Poor yield	B	MR	L-O	R	7	89767-12	Sm	B	HR	L	MT
89709-2	Sm, Kn	B	MR	L	MT	6	89767-15	Sl irr, f size	W	VS	O	SF
89711-1	Poor yield	T	MR	L-O	R	8	89769-18	Kn	W	SN	O-R	MT
89716-1	Kn	T	MR	L	SF	6	89772-2	Sm, GC, Kn	SW	RS	O	MT
89716-2	Irr size	T	LR	L-O	MT	7	89777-2	Sm	-	-	-	-
89717-14	Irr, Sm	B	MR	L-O	MT	7	89779-6	Spindle, Sm	T	LR	-	-
89718-2	Poor yield, Kn	T	HR	L-O	MT	6	89782-1	Checked skin, SE	W	SN	O-R	MT
89718-5	Purple eye, Sm	B	HR	L	R	7	89782-2	Sm	Bu	SN	O-R	MT
89718-11	Spindle, Sm	T	FR	O-L	R	5	89786-7	Poor yield, Sm	W	SN	R-O	SF
89718-13	Sm	T	MR	O-L	MT	6	89787-3	Irr	W	S	O-R	MT
89718-14	Poor yield, Sm	B	MR	L	MT	5	89792-22	Sm	W	RS	O	F
89720-8		B	MR	L	MT	5	89792-47		T	SN	R	R

See footnotes Table 1 for abbreviations.

NEW YORK-LONG ISLAND - SCAB EVALUATION

R. Loria and B. A. Taborsky

Evaluation of Resistance to Common Scab, 1982

Procedure. During 1982, 35 potato varieties and advanced breeding selections were evaluated for resistance to common scab in replicated plots in the field. Plots were planted on a well-drained sandy loam soil naturally infested with Streptomyces scabies that had been adjusted to pH 6.0. Seed pieces, 10 per entry, were planted 30.5 cm (12 inches) apart in single row plots with 86.4 cm (34 inches) between rows. Entries were replicated four times in a randomized complete block design. Plots were not irrigated during the early part of the season to promote infection by S. scabies otherwise standard cultural practices were used. Rainfall was below normal most of the growing season, but was 19.6 cm (7.7 inches) above normal in June. After harvest, 40 tubers from each plot were washed and examined for scab lesions. Each tuber was scored for lesion type (0 = no lesions, 4 = deep pitted lesions), and surface area covered by lesions (0 = no lesions, 4 = greater than 61%). These values were used to determine individual tuber severity ratings (0 = no scab, 140 = 61% or more of tuber surface covered by deep pitted scab). Severity ratings for each plot were calculated by averaging those for individual tubers. Data on scab severity, lesion type, lesion surface area, and scab incidence were evaluated using Duncan's multiple range test ($P = 0.05$).

Results. Based on the scab severity rating, the 10 entries most resistant in decreasing order, were: Lemhi, Superior, Norchip, Belchip, Afl8605, C7358-14, Oceania, Monona, NY-69, and T4-20. Acadia Russet, Simcoe, NY-63, NY-67, and T20-5 were significantly more susceptible (higher severity ratings) than was Katahdin. Analysis of disease incidence (percent tubers with scab) showed similar results. Lemhi had exceptionally low levels of scab by tubers (1.2%) which was significantly less than Katahdin (78.9%), but not significantly different from Superior (17.6%).

New York-Long Island Table 1. Resistance of potato varieties and breeding lines to common scab, caused by Streptomyces scabies, when evaluated at Riverhead, NY during 1982.

Variety or Breeding Line	Scab Severity Rating	% Tubers With Scab
Acadia Russet	14.81 ab ^{1/}	94.4 a
Belchip	1.39 hij	45.6 g
Chipbelle	4.22 ghij	76.9 abcdef
Hudson	9.76 cdef	91.9 ab
Katahdin	5.36 fghij	78.9 abcde
Lemhi	0.06 j	1.2 g
Monona	1.86 ghij	58.8 defg
Norchip	1.01 hij	30.6 g
Oceania	2.38 ghij	62.0 bcdefg
Rosa	4.24 ghij	82.6 abcd
Russette	3.18 ghij	62.5 bcdefg
Simcoe	13.28 abc	91.1 abc
Superior	0.41 ij	17.6 g
Wauseon	2.61 ghij	49.4 efg
AF-186-5	1.62 hij	44.4 g
AF-205-9	7.46 defg	85.0 abcd
AS-201-10	4.68 fghij	85.7 abcd
B-8972-1	5.54 fghij	77.8 abcde
C-7358-14	1.79 ghij	47.6 fg
CF-7523-1	6.79 efgh	83.8 abcd
F-71086	5.52 fghij	76.9 abcdef
F-73008	2.94 ghij	71.2 abcdefg
NY-59	3.69 ghij	63.8 abcdefg
NY-63	12.31 abcd	88.8 abcd
NY-67	11.36 bcde	86.9 abcd
NY-68	6.08 fghi	88.8 abcd
NY-69	2.49 ghij	65.6 abcdefg
NY-70	3.67 ghij	75.8 abcdef
T4-20	2.51 ghij	59.7 cdefg
T11-29	4.63 fghij	82.5 abcd
T20-5	16.91 a	93.1 ab
T30-36	4.67 fghij	81.8 abcd
T37-29	3.41 ghij	70.8 abcdefg
T88-6	3.36 ghij	70.7 abcdefg

^{1/} Average severity rating of 40 tubers (0 = no scab, 140 = 61% or more of surface area covered by deep pitted scab). Means followed by the same letter are not significantly different (P = 0.05), by Duncan's Multiple range test.

Results of Potato
Variety Evalua-
tions in Upstate
New York
1981-1982

Project Objectives. Evaluating varieties with golden nematode (GN) resistance is our highest priority, with yield, processability, disease and pest resistance, early maturity, storage ability and tuber appearance other important parameters. Ten replicated variety yield trials were conducted in upstate New York in 1982 in which a total of seventy-three named varieties and numbered clones were evaluated. Two hundred and three observational clones from Cornell University and USDA potato breeding programs were evaluated in unreplicated trials and a variety x fertilizer x spacing experiment was also conducted in upstate potato research.

Replicated Variety Trials. Yield data for 1982 are listed in Tables 2-11. Promising white GN resistant clones are AF186-5, AF205-9, B8710-1, CF7523-1, NY59, NY63 and NY67. Named white varieties with GN resistance which continue to yield competitively are Atlantic, Belchip, Oceania, Rosa and Wauseon. Denali and BR7093-23 are non-GN resistant white entries which also continue to perform well. At the present time no named russet variety with GN resistance is available. The russet clones B9335-7, B9391-2 and B9395-25, have GN resistance and had excellent yield and tuber shape in 1982. The non-GN russet Lemhi is the only named russet that has consistently shown both high yield and excellent tuber confirmation.

Season Problems. Rainfall was well below normal during the growing season, and specific gravity readings were ten to fifteen percent higher across all entries. Yields did not appear to be significantly reduced for full season varieties, but many shorter season varieties died down early, presumably due to drought stress, and may have had reduced yields. At harvest time the high specific gravity made tubers more prone to bruising and cracking. While hollow heart was not a problem, sunburn on whites and misshapen tubers on russets were frequently reported.

Cultural Practices Study. The variety x nitrogen fertilizer x spacing experiment evaluated the response of Atlantic, Belchip, Chipbelle, Katahdin, NY59 and Rosa to 75, 150 and 225 lbs N/A at row spacings of eight and eleven inches. Results of the analysis of variance indicate that varieties produced the most significant responses, N rate was next, and spacing was least with mostly non-significant responses. N rate did not significantly influence the number of tubers set per foot of row, the large size category, defects, nor specific gravity. Spacings did not significantly influence total yield, marketable yield, mean tuber weight nor specific gravity.

Utilization Data. Chip color results for ninety-one numbered clones and named varieties that were evaluated in replicated yield trials in 1981 (Table 13) indicate that only sixteen yielded acceptable chip color (Agtron M30 reading of 45 or higher) out of storage. Atlantic, Chipbelle, Monona, Rosa, Simcoe, B7151-4, B8799-8 and T4-20 were the best chippers of that group. After-cooking darkening (Table 14) of an objectional level was only found in Simcoe (3.9) and B9020-18 (4.0) out of eighty clones evaluated. In this same group nineteen entries lost more than 20 percent of their total weight in storage.

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¹In cooperation with C. MacNeil, C. Rackowski, M. Reisen, and E. Schimke.

Upstate New York Table 1. Tuber characteristics of clones in replicated trials, 1982.

Clone	Color	Texture	Shape	Depth	Clone	Color	Texture	Shape	Depth
Atlantic	Bu	SN	R	MT	B9395-3	B	MR	O	SF
Belchip	W	SN	R-O	SF	B9395-25	B	MR	O	SF
BelRus	DB	HR	O	SF	B9399-1	B	MR	O	MT
Chipbelle	Bu	SN	O-R	SF	B9399-23	W	MR	O	SF
Denali	W	SN	R-O	MT	B9423-4	W	SN	R	SF
Jemseg	Bu	SN	O	SF	B9468-1	W	SN	O	MT
Katahdin	W	SN	R	SF	B9486-2	W	SN	R-O	SF
Kennebec	W	SN	O-L	SF	BR5991-WV16	W	SN	R	MT
Lemhi	B	MR	O	SF	BR7093-23	W	SN	O	MT
Michibonne	W	SN	R	MT	CC26-1A	Bu	SN	O	SF
Michimac	W	SN	R	SF	CF7358-14	W	SN	O	MT
Monona	W	SN	R	SF	CF7523-1	W	SN	R	MT
Norchip	W	S	R	MT	NY59	W	SN	R	MT
Oceania	W	SN	R-O	SF	NY63	W	S	R-O	MT
Rosa	W-PK	SN	R	MT	NY67	W	SN	R	MT
R.Burbank	B	MR	L	MT	NY68	W	SN	R-O	MT
Shepody	W	SN	O-L	SF	T11-29	W	SN	R	MT
Superior	W	SN	R	SF	T20-5	Bu	SN	R-O	SF
Wauseon	W	SN	R	SF	T30-36	Bu	SN	R	SF
AF92-3	W	SN	O	MT	U709-3	W	S	R	SF
AF186-5	Bu	SN	O	SF	U710-2	BW	S	R-O	SF
AF205-9	W	SN	O-R	SF	U715-12	W	SN	O-R	SF
AF238-66	W	SN	O-L	MT	U715-52	Bu	SN	O-R	SF
B7805-1	W	SN	R-O	MT	U715-64	Bu	SN	O	SF
B6043-WV6	Bu	SN	R-O	MT	U723-8	W	SN	R-O	SF
B8685-4	Y-Bu	SN	R-O	SF	U728-19	W	SN	O-R	SF
B8710-1	W	S	O	SF	U725-1	W	SN	O-R	SF
B8799-8	W	S	R	MT	U729-21	W	SN	R	SF
B8934-4	B	MR	O	SF	U741-12	W-Bu	SN	R	SF
B8943-4	B	MR	O	SF	U741-20	W	SN	O	SF
B9097-5	Bu	SN	R	MT	U741-49	W-Bu	SN	R	MT
B9192-1	Bu	SN	R	MT	U756-31	W	SN	R-O	MT
B9335-7	W-Bu	SN	R	MT	U756-38	W	SN	O-R	SF
B9335-34	W	S	R-O	MT	U7685-6	W	SN	O	SF
B9336-27	W	SN	O-L	MT	UCS7619-9	W	SN	O-R	SF
B9340-13	W	SN	R-O	MT	UCS7638-22	W	S	R-O	SF
B9391-2	B	MR	O	SF					

Abbreviations: Color - B=brown, Bu=buff, DB=dark brown, PK=pink, W=white, Y=yellow.

Texture - HR=heavy russet, MR=medium russet, S=smooth, SN=slight net.

Shape - O=oblong or oval, L=long, R=round.

Depth - MT=medium thick, SF=slightly flattened.

Upstate New York Table 2. Variety Trial 1. Freeville, New York, 1982.

Clone ^{1/}	Yield (cwt/A)		% Kat Yield ^{2/}	% of Total Yield							Spec ^{3/} Grav	Int ^{4/}	App ^{5/}	Vine ^{6/} Mat
	US #1			Defects ^{2/}										
	Total	17-4	17-8	17-8-21	21-31	31-4	>4							
CF7523-1	395	355	119	27	56	8	0	4	92	0	7.9	4.8		
MICHIBONNE	395	355	119	12	62	16	1	6	88	0	6.8	4.8		
AF92-3	394	347	116	20	60	8	1	8	77	0	6.4	4.5		
MICHIMAC	352	323	109	28	57	7	0	1	91	0	7.1	6.3		
JEMSEG	347	316	106	13	60	18	1	4	76	2	7.4	1.5		
CC26-1A	346	315	106	17	64	10	0	5	90	0	7.0	3.8		
BR5991-WV16	350	314	105	30	53	6	0	4	105	0	7.3	6.0		
B6043-WV6	343	307	103	24	57	8	0	4	94	0	6.4	7.3		
KATAHDIN	328	299	100	17	58	16	1	4	92	0	6.6	6.5		
DENALI	331	296	99	19	56	14	1	4	107	0	7.3	5.8		
KENNEBEC	355	286	96	17	51	13	1	13 (S)	91	0	6.3	5.3		
SUPERIOR	291	262	88	33	56	1	0	3	77	0	6.9	2.3		
C7358-14A	312	261	88	20	54	10	0	11	79	0	6.9	2.3		
SHEPODY	282	242	81	20	52	14	0	9	98	2	5.9	5.3		
MONONA	265	235	79	28	57	3	0	5	82	1	7.1	4.3		
WALLER-DUNCAN (.05)	(40)	(44)							(3)					
C.V. %	9	10							2					

^{1/} Planted May 12, 1982, between-row spacing 34", within-row spacing 10", 1000 lbs/A of 15-15-5 applied in bands at time of planting, vines sprayed with 2.5 lb/A dinoseb September 2, harvested September 14.

^{2/} Defects = Total of all defects. Defects >7% in parenthesis with the major defects listed first.
Abbreviations: S = sunburn, M = misshapen, GC = growth cracks.

^{3/} Spec Grav = Specific gravity determined by hydrometer with 1.0 omitted.

^{4/} Int = Number of tubers with hollow heart and/or brown center of 40 tubers cut (10 per replication).

^{5/} App = Appearance rating based on a scale of 1 to 9; 1 = extremely rough unattractive, 9 = smooth, attractive.

^{6/} Vine maturity rated on a scale of 1 to 9; 1 = completely dead, 9 = green and vigorous. Rated on August 30.

Upstate New York Table 3. Variety Trial 2. Freeville, New York, 1982

Clone ^{1/}	Yield (cwt/A)		% Kat Yield 1 ⁷ / ₈ -4	% of Total Yield				Spec ^{3/} Grav	Int ^{4/}	App ^{5/}	Vine ^{6/} Mat
	Total	US #1 1 ⁷ / ₈ -4		US No. 1							
				1 ⁷ / ₈ -2 ¹ / ₂	2 ¹ / ₂ -3 ¹ / ₄	3 ¹ / ₄ -4	>4				
							Defects ^{2/}				
T20-5	490	440	166	13	66	11	0	76	0	7.5	3.0
NY59	417	391	147	19	60	15	1	95	0	7.1	7.5
NY67	414	385	144	16	63	15	0	95	1	7.1	7.0
T11-29	424	366	138	28	54	5	0	84	1	7.3	2.8
T30-36	396	351	132	21	56	12	0	79	1	6.8	3.0
Belchip	363	319	120	17	62	9	1	96	0	6.5	6.0
BR7093-23	354	314	118	23	57	8	0	97	0	7.4	6.8
NY63	353	313	118	17	58	13	0	82	0	7.1	3.0
Rosa	362	309	116	27	49	10	0	93	0	7.3	5.8
Wauseon	342	306	115	18	49	23	1	81	0	6.8	3.5
Atlantic	344	305	115	23	53	13	2	100	3	7.3	4.8
NY68	345	305	115	17	58	13	0	78	1	7.3	1.8
AF205-9	339	284	107	30	48	6	0	89	0	7.0	3.8
AF238-66	344	282	106	29	50	4	1	84	0	6.8	4.0
AF186-5	308	281	106	30	56	5	0	86	0	6.9	3.5
Katahdin	305	268	100	20	52	16	1	91	0	6.9	6.8
Chipbelle	292	254	96	29	53	5	0	105	5	6.5	6.0
Norchip	306	247	93	23	51	7	0	85	1	6.9	3.8
Waller- Duncan (.05)	(28)	(32)						(3)			
C.V. %	6	8						3			

^{1/} Planted May 12, 1982, harvested September 13. See footnote 1, Table 2.^{2/}-^{6/} See appropriate footnotes, Table 2.

Upstate New York Table 4. Variety Trial 3. Freeville, New York, 1982.

Clone ^{1/}	Yield (cwt/A)		% Kat Yield 1 ⁷ / ₈ -4	% of Total Yield					Spec ^{3/} Grav	Int ^{4/}	App ^{5/}	Vine ^{6/} Mat
	Total	US #1 1 ⁷ / ₈ -4		US No. 1								
				1 ⁷ / ₈ -2 ¹ / ₂	2 ¹ / ₂ -3 ¹ / ₄	3 ¹ / ₄ -4	>4	Defects ^{2/}				
B8710-1	471	407	134	30	52	5	0	9	80	0	6.9	2.0
B9468-1	479	374	124	22	51	5	0	19	86	2	6.1	3.3
B9097-5	415	372	122	14	61	14	0	7	83	1	6.8	1.8
B9423-4	477	372	122	22	44	11	0	16	80	2	7.1	3.8
OCEANIA	412	371	122	16	58	16	0	7	73	2	7.3	2.3
B9192-1	418	366	121	13	60	15	0	10	90	0	7.3	2.5
B9486-2	460	338	111	10	41	23	1	22	70	1	4.8	2.3
B9335-34	270	333	109	15	62	13	0	8	80	0	7.6	1.5
ATLANTIC	384	328	108	20	48	18	1	8	107	1	7.0	5.0
B9336-27	358	318	105	35	51	3	0	5	93	4	6.8	3.0
SUPERIOR	346	318	105	35	53	4	0	4	82	0	6.9	2.0
B9340-13	379	309	102	19	52	10	0	13	81	1	7.0	2.8
KATAHDIN	342	307	100	20	63	7	0	5	89	3	7.0	5.8
B8685-4	310	289	94	29	57	8	0	2	91	1	7.0	3.5
B8799-8	282	258	85	34	55	3	0	4	85	1	7.8	1.0
Waller- Duncan (.05)	(61)	(61)							(4)			
C.V. %	11	12							3			

1/ Planted May 14, 1982, harvested September 17. See footnote 1, Table 2.

2/-6/ See appropriate footnotes, Table 2.

Upstate New York Table 5. Variety Trial 4. Cornell Golden Nematode Resistant Clones, Freeville, NY, 1982.

Clone ^{1/}	Yield (cwt/A)		% Kat Yield 17-4	% of Total Yield				Defects ^{2/}	Spec ^{3/} Grav	Int ^{4/}	App ^{5/}	Vine ^{6/} Mat
	Total	US#1 17-4		17-21 17-4	21-31 21-4	31-4 31-4	>4					
U709-3	486	436	149	15	59	16	0	7	80	4	7.8	1.8
U756-31	450	415	141	19	63	11	0	4	77	0	7.6	2.0
U756-38	499	406	140	21	56	9	0	7	71	1	6.3	1.8
Rosa	455	404	135	30	53	6	0	6	93	2	6.6	3.8
U725-1	448	395	133	24	57	7	1	6	85	1	7.6	2.3
U715-12	468	385	132	17	56	10	0	14(GC)	83	5	7.1	2.8
U710-2	395	368	126	17	62	14	0	4	80	0	7.5	1.0
U729-21	390	356	119	37	49	5	0	1	77	0	7.5	2.3
U723-8	386	337	112	12	46	24	2	14(S)	79	2	7.8	1.3
U741-20	384	337	112	42	44	1	0	3	75	1	6.8	1.8
U715-52	399	334	111	17	54	12	1	11	85	2	7.4	3.0
U723-19	371	332	111	27	57	6	0	5	82	0	7.8	1.0
U741-12	346	327	110	20	58	17	0	2	82	1	6.8	2.8
Katahdin	355	300	100	16	51	18	1	10	92	2	6.1	5.8
U715-64	317	271	89	35	46	4	0	6	86	0	7.0	1.5
U741-49	271	245	83	11	52	27	1	6	85	0	7.4	2.3
U7685-6	353	236	80	16	42	10	1	27(S,GC)	82	0	7.1	2.0
Waller- Duncan (.05)	(51)	(63)							(3)			
C.V. %	10	13							3			
Other ^{7/}												
UCS7619-9	446	353	118	13	50	17	0	18(S,GC)	92	1	7.0	2
UCS7638-22	395	349	116	17	59	13	0	7	79	1	7.3	2

^{1/} Planted May 4, 1982, harvested September 13. See footnote 1, Table 2.

^{2/} -6/ See appropriate footnotes, Table 2.

^{7/} Not included in analysis of variance. Twenty tubers examined for internal defects.

Upstate New York Table 6. Variety Trial 5. Russet Variety Trial, Freeville, New York, 1982.

Clone ^{1/}	Yield (cwt/A)		% RB Yield 4-16 oz	% of Total Yield						Spec ^{3/} Grav	Int ^{4/}	App ^{5/}	Vine ^{6/} Mat
	US #1			US #1									
	Total	4-16 oz		0-4	4-10	10-16	>16	Defects ^{2/}					
B9335-7	407	287	240	4	16	55	11	14 (GC)	83	2	7.3	2.8	
B9399-23	361	263	220	11	27	46	6	11 (M)	88	2	7.0	3.5	
KATAHDIN	287	262	213	6	26	66	0	3	93	0	7.0	6.3	
B9395-25	344	212	178	27	49	13	1	11	85	2	7.0	3.5	
B9395-3	333	206	171	35	55	7	0	3	81	0	7.5	3.3	
LEMHI	319	202	165	31	51	13	1	5	105	0	7.3	5.3	
B9391-2	307	193	157	34	55	8	0	3	84	0	7.5	2.8	
B8943-4	301	155	130	37	46	5	0	12	85	0	6.9	4.0	
BELRUS	272	150	124	44	47	7	0	2	94	0	8.5	4.0	
B9399-1	271	138	110	31	44	7	0	17 (M)	81	0	6.4	3.5	
RUSSET BURBANK	306	125	100	47	38	2	0	12 (M)	98	4	6.1	5.5	
B8934-4	261	125	100	36	37	10	0	17 (M,S)	87	4	6.8	4.3	
WALLER-DUNCAN (.05)	(46)	(45)							(4)				
C.V. %	11	17							3				

^{1/} Planted May 14, 1982, harvested September 16. See footnote 1/, Table 2.

^{2/-6/} See appropriate footnotes, Table 2.

Upstate New York Table 7. Madison County Muck Variety Trial, Chittenango, New York, 1982.

Clone ^{1/}	Yield (cwt/A)		% Kat Yield 1 ⁷ / ₈ -4	% of Total Yield			Spec ^{3/} Grav	Int ^{4/}
	Total	US #1 1 ⁷ / ₈ -4		US No. 1		Defects ^{2/}		
				<1 ⁷ / ₈	1 ⁷ / ₈ -4				>4
Belchip	372	326	128	10	87	0	99	0
NY59	369	323	127	11	87	1	97	0
Rosa	359	282	110	15	78	0	92	0
Atlantic	374	265	104	23	75	0	98	1
Katahdin	320	256	100	15	80	0	93	2
B7805-1	299	247	97	11	82	0	86	0
AF186-5	302	217	85	27	71	0	95	2
AF205-9	282	197	77	25	70	0	96	0
Chipbelle	255	189	74	19	74	0	99	0
Lemhi*	317	182	71	38	58	0	95	4
R.Burbank*	243	86	34	63	30	0	90	2
Bel Rus*	97	52	20	47	52	0	88	0
Waller- Duncan	(72)	(57)					(3)	
(.05)								
C.V. %	17	19					2	

* Russets sized by weight corresponding to round white size categories as follows: <1 $\frac{7}{8}$ " = 0-4 oz, 1 $\frac{7}{8}$ -4" = 4-16 oz, >4" = >16 oz.

^{1/} Planted May 18, 1982, vines sprayed with dinoseb in mid-September, harvested October 8. Within row spacing 9", between row spacing 36", x 800 lb/A of 15-15-15 applied in bands at planting.

^{2/}, ^{3/}, ^{4/} See appropriate footnotes, Table 2.

Upstate New York Table 8. Orleans County Muck Variety Trial, Elba, New York, 1982.

Clone ^{1/}	Yield (cwt/A)		% Kat Yield 1 $\frac{7}{8}$ -4	% of Total Yield			Defects ^{2/}	Spec ^{3/} Grav	Int ^{4/}
	Total	US #1 1 $\frac{7}{8}$ -4		<1 $\frac{7}{8}$	US No. 1 1 $\frac{7}{8}$ -4	>4			
NY59	438	379	109	11	86	0	2	80	0
Kennebec	425	352	101	8	83	0	10(S)	82	0
Katahdin	424	348	100	8	83	0	10(S)	80	0
Denali	404	341	98	13	84	0	3	94	0
Belchip	400	336	97	10	84	0	6	88	1
Monona	368	334	96	7	91	0	2	72	0
Wauseon	420	334	96	12	80	0	9	72	0
BR7093-23	409	327	94	15	80	0	5	82	0
B7805-1	396	327	94	8	82	0	10(S)	77	0
Norchip	376	310	89	10	83	0	7	80	0
Rosa	385	286	82	19	73	0	8(S)	79	0
Atlantic	372	267	77	23	71	0	6	86	0
Chipbelle	366	257	74	19	70	0	11(S)	93	1
AF205-9	363	252	72	25	68	0	7	84	0
Lemhi*	375	220	63	37	58	0	6	89	1
B8934-4*	320	201	58	24	64	0	13(S)	77	0
R. Burbank*	321	192	55	32	60	0	8	84	1
AF186-5	256	181	52	26	71	0	3	83	0
B8943-4*	278	135	39	21	48	0	30(S,M)	77	0
BelRus*	208	103	30	48	49	0	4	84	0
Waller- Duncan (.05)	(81)	(73)						(3)	
C.V. %	16	20						3	

* Russets sized by weight corresponding to round white size categories as follows: <1 $\frac{7}{8}$ " = 0-4 oz, 1 $\frac{7}{8}$ -4" = 4-16 oz, >4" = >16 oz.

^{1/} Planted May 11, 1982, vines sprayed with dinoseb in mid-September, harvested October 5. Within row spacing 9", between row spacing 34", 900 lb/A of 14-14-14 applied in bands at planting.

^{2/}, ^{3/}, ^{4/} See appropriate footnotes, Table 2.

Upstate New York Table 9. Steuben County Variety Trial, Cohocton, New York, 1982.

Clone ^{1/}	Yield (cwt/A)		% Kat Yield 1 $\frac{7}{8}$ -4	% of Total Yield		Defects ^{2/}	Spec ^{3/} Grav	Int ^{4/}
	Total	US #1 1 $\frac{7}{8}$ -4		<1 $\frac{7}{8}$	US No. 1 1 $\frac{7}{8}$ -4			
NY59	493	404	137	6	82	3	89	0
Kennebec	440	333	113	6	76	3	89	2
BR7093-23	455	327	111	9	72	0	92	3
Belchip	414	324	110	10	78	0	94	1
Atlantic	396	302	103	6	76	2	95	5
Katahdin	400	294	100	6	73	3	86	7
AF205-9	375	289	98	15	77	0	89	0
Rosa	428	281	96	11	65	0	85	1
Wauseon	354	281	96	9	80	0	82	2
Denali	345	276	94	9	80	0	100	0
Lemhi*	424	262	89	23	63	8	94	8
Monona	315	253	86	9	80	0	81	1
Chipbelle	337	251	85	11	75	1	98	1
AF186-5	344	250	85	12	73	1	88	3
B7805-1	340	245	83	8	71	4	78	3
Norchip	329	215	73	10	66	0	88	0
B8943-4*	327	195	66	22	60	0	86	1
R. Burbank*	396	185	62	23	47	1	91	2
BelRus*	369	153	52	40	56	1	89	0
B8934-4*	262	151	51	22	59	1	85	0
Waller- Duncan (.05)	(95)	(74)					(5)	
C.V. %	17	20					4	

* Russets sized by weight corresponding to round white size categories as follows: <1 $\frac{7}{8}$ " = 0-4 oz, 1 $\frac{7}{8}$ -4" = 4-16 oz, >4" = >16 oz.

1/ Planted May 26, 1982, vines sprayed with dinoseb in early September, harvested October 4. Within row spacing 9", between row spacing 36", 113 lb/A of N, K and 226 lb/A P liquid fertilizer applied in bands at planting.

2/, 3/, 4/ See appropriate footnotes, Table 2.

Upstate New York Table 10. Wayne County Muck Variety Trial, Savannah, New York, 1982.

Clone- 1/	Yield (cwt/A)		% Kat Yield 1 7/8-4	% of Total Yield		Spec- 3/ Grav	4/ Int-
	Total	US #1 1 7/8-4		<1 7/8	>4		
				US No. 1 1 7/8-4	Defects- 2/		
NY59	469	394	127	11	4	85	0
Katahdin	366	310	100	5	3	77	2
Ontario	374	293	95	12	0	83	0
Denali	342	289	93	11	1	89	4
Rosa	365	284	92	13	0	87	0
Kennebec	368	278	90	7	3	78	3
BR7093-23	313	254	82	12	0	85	1
Belchip	275	241	78	6	2	84	0
Wauseon	285	237	77	13	0	78	0
Lemhi*	346	237	77	16	6	82	4
Atlantic	253	211	68	11	1	86	4
B7805-1	226	169	55	16	1	73	0
AF186-5	216	160	52	24	0	82	0
Norchip	211	158	51	20	0	79	0
AF205-9	231	150	48	27	0	81	1
R. Burbank*	264	150	48	23	2	82	3
Monona	189	148	48	15	0	75	0
Chipbelle	178	143	46	17	0	92	0
B8943-4*	171	89	29	37	0	80	0
B8934-4*	132	65	21	38	0	75	0
BelRus*	101	57	18	45	0	81	0

* Russets sized by weight corresponding to round white size categories as follows: <1 7/8" = 0-4 oz, 1 7/8-4" = 4-16 oz, >4" = >16 oz.

1/ Planted May 11, 1982, vines sprayed with dinoseb in early September, harvested September 29.

Within row spacing 9", between row spacing 36", 1000 lb/A of 15-15-15 applied in bands at planting.

2/, 3/, 4/ See appropriate footnotes, Table 2.

Note: Analysis of variance not reported due to unequal replications.

Upstate New York Table 11. Wyoming County Variety Trial, Warsaw, New York, 1982.

Clone- 1/	Yield (cwt/A)		% Kat Yield 1 7/8-4	% of Total Yield			Spec- 3/ Grav	Int- 4/
	Total	US #1 1 7/8-4		<1 7/8	US No. 1 1 7/8-4	>4		
NY59	650	571	124	6	88	5	78	1
Kennebec	590	490	107	4	83	3	78	1
Katahdin	572	460	100	3	80	10	76	1
Rosa	558	457	99	11	82	1	76	7
BR7093-23	482	427	93	9	88	0	80	3
Atlantic	497	421	92	9	85	3	90	6
Belchip	488	421	92	8	86	1	90	3
Dena1i	466	391	85	11	84	2	93	0
Wauseon	459	390	85	10	85	0	77	3
B7805-1	436	374	81	8	86	2	72	5
AF205-9	449	373	81	12	83	2	83	0
AF186-5	438	364	79	14	83	1	82	2
Norchip	410	346	75	11	85	0	80	0
Lemhi*	441	342	74	13	76	6	78	12
Monona	384	342	74	6	90	2	74	4
R. Burbank*	465	301	65	19	63	1	85	0
Chipbelle	347	297	65	8	86	4	91	1
B8934-4*	343	253	55	16	74	2	79	5
B8943-4*	309	203	44	29	66	0	76	5
BelRus*	232	143	31	37	63	0	85	0
Waller- Duncan(.05)	(88)	(87)					(4)	
C.V. %	14	17					4	

* Russets sized by weight corresponding to round white size categories as follows: <1 7/8" = 0-4 oz, 1 7/8" = 4-16 oz, >4" = >16 oz.

1/ Planted June 1, 1982, vines sprayed with dinoseb in mid-September, harvested October 7. Within row spacing 9", between row spacing 36", 1200 lb/A of 10-20-10 applied in bands at planting.
2/, 3/, 4/ See appropriate footnotes, Table 2.

Upstate New York Table 12. Effect of nitrogen rate and spacing on yield and quality of six varieties, Freeville, New York, 1982.

Variety	Yield (cwt/A)						% of Total Yield							Vine ^{9/} Mat ^{9/}	
	N Rate ^{2/}	Sp ^{3/}	Tot.	Mkt 1 $\frac{1}{2}$ -4	No/ft ^{4/}	MTW ^{5/}	US No. 1					Def ^{6/}	Int ^{7/}		SG ^{8/}
							1 $\frac{1}{2}$ -1 $\frac{1}{2}$	1 $\frac{1}{2}$ -2 $\frac{1}{2}$	2 $\frac{1}{2}$ -3 $\frac{1}{2}$	3 $\frac{1}{2}$ -4	>4				
ATLANTIC	75	8	291	243	7.5	4.0	8	24	49	10	1	8	0	103	2.8
ATLANTIC	75	11	306	255	7.1	4.7	8	23	52	8	0	9	1	103	3.0
ATLANTIC	150	8	326	263	7.8	4.4	7	20	45	16	1	11	0	103	3.8
ATLANTIC	150	11	318	264	6.7	5.1	5	19	51	14	0	11	0	104	4.3
ATLANTIC	225	8	335	287	7.1	5.4	5	19	51	15	0	9	0	103	5.5
ATLANTIC	225	11	321	278	7.0	4.8	6	18	52	17	1	8	0	106	5.0
8ELCHIP	75	8	323	272	8.4	4.0	7	22	52	10	0	9	0	102	4.3
8ELCHIP	75	11	314	237	7.9	4.2	14	17	43	15	0	11	0	102	4.8
8ELCHIP	150	8	356	289	7.5	5.0	7	18	48	15	0	11	0	100	5.8
8ELCHIP	150	11	351	299	8.0	4.6	6	18	48	19	0	9	0	99	6.0
8ELCHIP	225	8	362	294	8.7	4.4	6	17	49	15	0	13	0	101	6.8
8ELCHIP	225	11	345	300	8.0	4.5	5	16	54	17	0	8	0	102	7.0
CHIP8ELLE	75	8	265	230	7.0	4.0	10	38	44	4	0	4	1	107	2.8
CHIP8ELLE	75	11	293	256	7.7	4.0	9	31	51	5	0	4	1	107	4.0
CHIP8ELLE	150	8	324	284	8.4	4.0	8	34	49	5	0	4	1	107	5.3
CHIP8ELLE	150	11	303	262	8.1	3.9	9	31	49	7	0	5	0	107	4.8
CHIP8ELLE	225	8	320	284	7.1	5.0	8	28	53	8	0	4	1	107	6.0
CHIP8ELLE	225	11	309	274	7.6	4.3	8	24	56	9	0	3	1	107	6.0
KATAHDIN	75	8	297	259	7.8	4.0	9	27	49	11	0	4	0	93	3.7
KATAHDIN	75	11	309	263	7.0	4.7	7	19	49	17	0	8	0	92	4.8
KATAHDIN	150	8	326	281	8.5	4.0	8	25	52	10	0	5	0	92	5.0
KATAHDIN	150	11	321	278	7.2	4.6	6	19	48	19	0	6	0	92	4.8
KATAHDIN	225	8	349	293	8.1	4.5	7	19	51	14	0	9	0	93	6.5
KATAHDIN	225	11	321	274	7.3	4.6	6	18	49	18	0	8	0	92	6.0
NY59	75	8	355	317	9.4	4.0	7	30	52	7	0	4	0	100	5.3
NY59	75	11	360	319	9.3	4.0	7	25	53	10	0	5	0	98	5.5
NY59	150	8	401	359	10.6	4.0	7	28	53	8	0	4	0	100	6.0
NY59	150	11	362	328	8.1	4.7	6	21	55	15	0	4	0	97	6.5
NY59	225	8	400	360	10.1	4.1	7	26	52	12	0	3	0	98	7.3
NY59	225	11	391	337	9.2	4.4	7	23	55	8	0	6	0	96	7.3
ROSA	75	8	330	263	10.8	3.2	14	38	38	3	0	7	0	92	2.5
ROSA	75	11	332	265	10.3	3.4	13	38	39	3	0	7	0	91	3.0
ROSA	150	8	363	281	11.6	3.3	14	36	37	5	0	9	0	97	4.8
ROSA	150	11	361	286	10.6	3.6	11	32	42	6	0	10	0	97	4.5
ROSA	225	8	351	278	10.4	3.5	12	32	42	5	0	9	0	99	5.8
ROSA	225	11	359	293	10.0	3.7	10	29	44	9	0	9	0	99	5.3

Significance Level within sources of variation * = 5%, ** = 1%

Rep	ns	ns	*	*	ns	ns	ns	ns	*	ns	*
Variety	**	**	**	**	**	**	**	**	ns	*	**
N rate	**	**	ns	**	**	**	*	**	ns	ns	ns
Variety x N rate	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	**
Spacing	ns	ns	**	ns	ns	**	ns	**	ns	ns	ns
Variety x Spacing	ns	ns	*	ns	ns	ns	ns	ns	ns	ns	*
N rate x Spacing	*	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
C.V. %	7	9	10	14	8	13	10				2

1/ Planted May 17, vines sprayed with 1.6 lb/A ametryn September 17 and 2.5 lb/A dinoseb September 22, harvested reps 1 and 2 September 30, reps 3 and 4 October 12. Experimental design a split-split plot where main plot is variety, sub-plot is N rate and sub-sub plot is spacing within the row. Between row spacing is 34". Plot size is 2 rows by 20'.

2/ N rate in lbs/A banded with 150 lbs/A of P and K at planting.

3/ Sp = spacing in inches within the row. Seedpieces were handplanted.

4/ No/ft = number of tubers at harvest per foot of row.

5/ MTW = mean tuber weight in ounces.

6/ Def = total of all defects. See footnote 2, Table 2.

7/ Int = number of tubers with hollow heart and/or brown centers of 20 tubers cut.

8/ SG = specific gravity determined by hydrometer with 1.0 omitted.

9/ Vine maturity rated September 10, 1=completely dead, 9=green and vigorous.

Upstate New York Table 13. 1981 Potato Variety Trials^{1/}, Freeville, New York, Chip Color Results^{2/}

Clone	Trial I	Trial II		Trial III		Trial IV		Trial V		Trial VI	Savannah Muck
	50	50	45-60	50	45-60	50	45-60	50	45-60	50	50
Atlantic				46	41			44	46		46
Belchip				42	42						51
Bel Rus										34	
Chipbelle				49	46						55
Denali						41					46
HighTat Rus.										27	
Hudson											31
Jemseg	51										38
Katahdin		38	40	39	39	35	34	39	35		38
Kennebec						42	42				
Lemhi										41	
Michibonne						29					
Michimac						34					
Monona						51	46				50
Norchip				42	43						49
Peconic				42	41						47
Rosa		37	41	44	43						51
Rus. Burbank										35	
Shepody						36					
Simcoe						55	50				
Superior	56										
Trent	58										
Wauseon						35					43
AF92-3						29					
AF186-5				41							
AF238-66				42	44						
B6043-WV6						20					
B7151-4						51	44				
B7592-1				40							
B7805-1	44										
B8086-3						39					
B8491-1				41							
B8514-8								41			
B8710-1								27			
B8771-6								42	31		
B8798-20								47	38		
B8799-8						55	41				
B8799-13								49	38		
B8887-1	55										
B9020-18										30	
B9062-5	56										
B9097-5	59										
B9285-3								28			
B9286-1								18			
B9332-1								34			
B9335-7								32			
B9335-17								31			
B9335-34								43	33		
B9335-35								43	35		
B9335-60								32			
B9336-27								36			
B9340-3								39			
B9340-7*								43	41		
B9340-13								43	31		
B9384-4								41			
B9384-6								38			
B9391-2										27	
B9395-3										35	
B9395-7										35	
B9395-25										34	
B9399-1											
B9399-23										38	
B9400-5										26	
B9473-2								25			
BR5991-WV16						34					

(Cont'd next page)

Upstate New York Table 13 (Continued)

Clone	Trial I	Trial II		Trial III		Trial IV		Trial V		Trial VI	Savannah Muck
	50	50	45-60	50	45-60	50	45-60	50	45-60	50	50
BR7093-23				45	47						
C7232-4	59										55
C7358-14A	55										
CC26-1A	56										
CF7523-1	49										
F69026											
NY59				26							
NY63				33							
NY67				33							
NY68	56										
S376-2				39							
S377-8				28							
S377-41				31							
T4-20		45	50								
T5-10		44	48								
T5-24		28									
T11-29		23									
T20-5		20									
T30-36		35									
T30-47		38									
T30-71		32									
T37-29		24									
T53-26		43	42								
T88-6		32									
T272-32		28									
T275-100		22									
HSD (.05) Tukey	(7)	(9)	(9)	(12)	(10)	(8)	(5)	(8)	(7)	(7)	

*Not included in analysis of variance.

1/ See 1980-1981 report for harvest results.

2/ Agtron M30 colorimeter readings. Standards for whole chips were discs 00 and 90 which were calibrated to give readings of 0 and 90 respectively. Minimum value for "generally acceptable color" for whole chips is about 45. Two slices of each of eighteen tubers per replication were fried in vegetable oil at 365°F. Variety Trial 1 samples were fried 9/3/81, one week after harvest. Other 50°F samples were stored at 50°F from time of harvest until fried 1/4/82. The 45-60°F samples were stored at 45°F from time of harvest until 2/22/82 when the temperature was raised to 60°F. Samples were fried 3/22/82.

Upstate New York Table 14. 1981 Potato Variety Trials, Freeville, New York, After-cooking Darkening^{1/} and Weight Loss Results^{2/}

Clone	After-cooking darkening						Sprout weight or weight loss other than sprouts expressed at % of total weight					
	Variety Trial Number			Variety Trial Number			Variety Trial Number					
	II	III	IV	V	VI		II	III	IV	V	VI	
							Spr	Oth	Spr	Oth	Spr	Oth
Atlantic		4.9		5.0								
Belchip		5.0					2.7	9.3		4.2	10.7	
Bel Rus					4.9		4.8	13.8				5.0 14.6
Chipbelle		4.8										
Denali			4.3				6.3	13.0				
Highlat Rus.					4.8				4.7	12.9		
Katahdin	4.4	4.7	4.5	4.7			4.9	11.7	4.0	13.6	4.5	11.5
Kennebec		4.7							1.6	9.7		
Lemhi					4.3							
Michibonne			5.0						1.8	10.8		2.9 9.6
Michimac			4.7						4.2	11.5		
Monona			5.0						4.3	13.1		
Norchip		4.9										
Peconic		4.5										
Rosa	4.6	4.8										
Rus. Burbank					5.0		2.3	10.5				0.0 3.6
Shepody			5.0						2.2	7.3		
Simcoe			3.9						4.6	10.5		
Wauseon			5.0						2.0	10.5		
AF92-3			5.0						2.3	7.1		
AF186-5		5.0										
AF238-66		4.6										
B6043-WV6			4.8						0.0	19.8		
B7151-4			5.0						2.1	13.2		
B7592-1		5.0										
B7805-1												
B8086-3			4.9						6.7	12.5		
B8491-1		4.5										
B8514-8				4.4						1.6	10.5	
B8710-1				5.0						7.7	14.9	
B8771-6				4.7						5.8	10.1	
B8798-20				4.5						2.7	12.8	
B8799-8			4.9						1.7	8.4		
B8799-13				4.3						3.7	16.9	
B8887-1												
B9020-18					4.0							
B9285-3				4.6						19.2	27.2	5.8 15.7
B9286-1				4.9						8.3	18.1	
B9332-1				4.8						4.8	13.9	
B9335-7				5.0						8.1	14.9	
B9335-17				4.9						13.5	20.0	
B9335-34				4.9						0.0	10.7	
B9335-35				4.7						7.3	13.3	
B9335-60				4.5						5.1	10.3	
B9336-27				4.8						10.9	17.7	

Upstate New York Table 14 (Continued)

Clone	After-cooking darkening				Sprout weight or wiegth loss other than sprouts expressed at % of total weight											
	Variety Trial Number				Variety Trial Number											
	II	III	IV	V	VI	II		III		IV		V		VI		
	Spr	Oth	Spr	Oth	Spr	Oth	Spr	Oth	Spr	Oth	Spr	Oth	Spr	Oth	Spr	Oth
B9340-3				5.0												
B9340-7*				4.7									8.1	15.5		
B9340-13				4.9									7.5	15.3		
B9384-4				4.9									11.3	18.2		
B9384-6				5.0									6.8	11.4		
B9391-2					4.6										7.3	13.2
B9395-3					4.7										9.8	16.9
B9395-7					4.8										4.5	12.3
B9395-25					4.3										2.1	8.1
B9399-1																
B9399-23					4.5										8.2	13.7
B9400-5					4.6										2.7	9.1
B9473-2				4.9									9.1	14.8		
BR5991-WV16			4.5													
BR7093-23		4.9				1.0	9.4									
F69026																
NY59						1.2	8.7									
NY63						4.1	9.2									
NY67						1.6	11.4									
S376-2						3.5	12.9									
S377-8						0.8	7.0									
S377-41						6.0	12.9									
T4-20	4.6					2.0	8.3									
T5-10	5.0					2.8	8.0									
T5-24	4.7					1.8	6.8									
T11-29	5.0					4.2	12.4									
T20-5	4.8					12.4	18.7									
T30-36	4.8					2.6	12.2									
T30-47	4.8					1.2	6.5									
T30-71	4.5					3.6	9.5									
T37-29	4.8					5.2	9.3									
T53-26	5.0					0.0	5.5									
T88-6	4.9					7.0	13.4									
T272-32	4.9					2.0	9.4									
T275-100	4.9					2.4	7.6									
						(1.5)	(6.3)	(3.5)	(7.0)	(1.2)	(10.1)	(2.3)	(12.7)	(1.5)	(11.1)	

* Not included in analysis of variance.

1/On 1/13/82 five tubers per each replication were peeled, dipped in 0.5% sodium bisulfite, cooked 7 minutes in an autoclave at 15 p.s.i. and rated from 1-5, where 1 = severe after-cooking darkening, 5 = no darkening.

2/Stored at 50°F from time of harvest. Data collected 3/10/82.

NEW YORK

R. L. Plaisted and H. D. Thurston

Crossing and Seedling Production	This year 153 crosses were made for variety selection purposes. These all segregate for resistance to the golden nematode, and several will segregate for resistance to scab, PVX, PVY, and late blight. The crosses involve round white, russets, and reds. In germplasm development, 37 crosses were made for resistance to bacterial wilt and root knot nematodes, and 316 were made for glandular trichomes for insect resistance. Approximately 76,000 seedlings were transplanted for variety development and 44,000 for the neotuberosum project. The latter were inoculated with PVX, PVY, and late blight as seedlings and susceptible plants removed. Eighty seven thousand first size seedling tubers were planted at Ithaca, and 30,000 second size tubers were planted at Willsboro. A total of 25,076 single tuber selections were made.
Early Generation Selections	In the first year field observation plots, 321 clones were selected from 2,392. In the second year plots, 101 were saved from 346. The next generation (A's) had 102 entries in yield trials at Ithaca and Riverhead. At this time, 34 have been saved. The 32 clones in the second year of yield trials (U's) have been reduced to 8 (Table 1).
Advanced Selections	The performance of these clones is given in Table 2. NY59 is a high yielding clone with resistance to GN, Vert. wilt, late blight, and early blight. It will not make chips and is subject to heat necrosis on Long Island. It is under farm scale evaluation on muck land where it seems particularly well suited. Late vine maturity may be a problem. NY63 continues to be a very attractive tablestock variety with large tubers. Yield is somewhat better than Katahdin upstate and better on Long Island. It is resistant to GN and Vert. wilt, but susceptible to scab. It has performed well on Long Island farm demonstrations. NY64 is a GN resistant tablestock variety with some resistance to scab, but susceptible to Vert. wilt. It is under farm scale evaluation. NY67 is a late maturing GN resistant clone with excellent resistance to Vert. wilt and early blight. NY69 is a tuberosum x adigena hybrid with resistance to GN and scab. It produces an early crop with heavy set. A striking feature is the excellent skin set. T4-20 has large tubers with an early set and potential for chipping from 50° storage. T20-5 has some potential for tablestock, but on the verge of discard for scab susceptibility. T53-26 looks

too good to be true. In three years, it has yielded about 10% more than Katahdin with same size distribution. The specific gravity have averaged about 10 units higher than Katahdin and will chip most years out of 50° storage. It is resistant to GN, Vert. wilt, scab, and late blight. It has the longest tuber dormancy of any clone we have. Internal defects have been no problem. On one measure it does fall short, it turns gray after boiling.

New York Breeding Table 1.

Clone	cwt > 1-7/8	cwt > 2½	2½ / 1-7/8	cwt pickout	Type pickout ¹	Appearance ²	Specific gravity ³
Riverhead							
Katahdin	466	277	60	1	G	7.2	77
Hudson	544	387	71	20	K	6.4	70
U709-3	430	203	47	17	G	7.0	72
U715-52	331	205	62	5	G	8.0	73
U715-64	335	80	26	6	G	6.2	70
U715-94A	393	230	58	4	G	7.6	86
U723-8	391	214	55	4	G	7.4	72
U729-21	480	232	48	0		7.2	72
U741-12	385	211	55	4	G	6.8	80
U756-31	556	346	62	4	G	7.6	74
UCS7698-1R	ONE REP					7.0	74
Ithaca							
Katahdin	306	293	74	5	G	6.0	
Superior	355	192	54	0		4.8	
Norchip	322	119	37	14	G	5.2	
Monona	369	250	67	2	M	5.4	
Hudson	433	355	82	14	MG	6.0	
Rosa	433	217	50	0		6.8	
U709-3	500	413	82	18	G	7.0	
U715-52	319	232	73	8	G	7.8	
U715-64	329	85	26	4	G	6.6	
U715-94A	420	275	66	12	G	6.8	
U723-8	369	271	73	8	G	7.6	
U729-21	342	165	48	3	G	6.8	
U741-12	358	286	80	5	G	6.8	
U756-31	402	271	68	5	M	6.6	
UCS7598-1R	295	190	64	14	G	8.0	
Ithaca (Early Harvest July 23)							
Katahdin	230	87	38	2	K	7.0	
U709-3	380	212	70	25	R	6.8	
U715-52	257	138	53	2	G	7.0	
U715-64	264	49	19	9	GK	7.2	
U715-94A	291	141	48	7	G	7.4	
U723-8	291	170	58	7	R	7.6	
U729-21	315	92	29	0		7.2	
U741-12	300	176	58	2	G	7.8	
U756-31	360	212	59	11	G	7.2	

1/ G=growth cracks, K=knoobs, M=mishappen, R=rhizoctonia

2/ Appearance scored, 0=very poor to 9=very good.

3/ Specific gravity coded 1.0xx.

New York Breeding Table 2. Advanced Selection

Clone	cwt > 1-7/8	cwt > 2½	2½ / 1-7/8	cwt pickout	Type pickout ¹	Appearance ²	Specific gravity ³
<u>Riverhead</u>							
Katahdin	421	221	52	2	M	7.0	74
Rosa	341	123	36	0		6.9	77
Superior	374	127	34	2	M	5.1	76
NY63	510	294	58	2	G	8.6	74
NY67	446	224	50	3	G	7.5	77
NY69	397	146	37	1	K	7.0	66
T4-20	394	227	58	0		6.1	74
T20-5	458	262	58	1	K	6.5	73
T53-26	562	316	56	11	M	6.0	88
<u>Ithaca</u>							
Katahdin	420	299	71	4	G	6.6	82
NY63	440	352	80	15	G	8.4	77
NY64	456	303	66	22	G	6.0	80
NY67	436	304	70	18	G	7.6	85
NY69	414	241	58	2	K	8.2	70
T4-20	414	324	78	3	G	6.8	32
T20-5	459	359	78	2	G	7.8	72
T53-26	513	364	71	13	M	7.4	35
<u>Ithaca (Early Harvest July 23)</u>							
Katahdin	214	84	39	3	G	6.7	
Superior	235	93	39	6	K	6.8	
Norchip	251	70	28	24	K	6.0	
Monona	243	113	47	4	K	6.0	
Hudson	239	158	66	13	K	7.0	
Rosa	266	56	21	1	K	7.4	
NY59	215	99	46	3	K	6.8	
NY63	207	121	58	13	G	7.2	
NY67	167	32	19	4	G	7.0	
NY69	221	76	34	3	K	8.0	
T4-20	265	153	58	0		6.8	
T20-5	211	154	73	3	G	7.8	
T53-26	138	97	71	3	G	6.8	

1/ G = growth cracks, K=knobs, M=mishappen, R=rhizoctonia

2/ Appearance scored, 0=very poor to 9=very good.

3/ Specific gravity coded 1.0xx.

NORTH CAROLINA

F. L. Haynes

Breeding Program

The 1982 season began late with the normal planting dates delayed by very heavy rainfall. The eastern trials at four locations in the early commercial area were delayed three to four weeks, causing the seed to be in very poor condition. This delay coupled with heavy rainfall following planting resulted in poor stands and poor early season growth. Only two of the four trials are reported here (North Carolina Tables 1 and 2). Yield data in these trials are probably not typical of the entries. The maturity and processing information should be reliable.

Clonal maintenance, increase and the summer hybridization program were conducted at the Waynesville Station in the mountains. Tetraploid crosses of 38 combinations produced segregating families for evaluation.

Adaptation and Diploid Breeding

Evaluation of the adapted diploid PHU-STN population was continued at the Fletcher Station. Segregates from seed nurseries of heat tolerant, high dry matter and early blight resistant sub-populations were evaluated. The high dry matter population was screened for tuber type and production. These continued to improve without erosion of the high dry matter. The heat tolerant population was increased and prepared for extensive evaluation in 1983.

Advanced selections from the early blight resistant population were planted in a replicated trial. Consistently high levels of resistance were identified. The heritability of resistance was determined. Estimates of 0.86 for broad-sense and 0.80 for narrow-sense heritability were obtained. An interbreeding seed nursery was conducted to produce a new cycle for recurrent selection for resistance.

Clones from the high dry matter population were screened for resistance to tuber soft rot bacteria. Various isolates of Erwinia chrysanthemi, E. carotovora subsp. carotovora and E. carotovora subsp. atroseptica were used for the screenings. High levels of resistance to tuber rot were identified, with six clones being resistant to all isolates used. The black leg stage of the disease is currently being studied and preliminary results indicate a high level of resistance.

The population was screened in Peru for resistance to late blight. High levels of minor gene resistance were identified.

Clones from all sub-populations were screened for production of unreduced gametes. Genotypes producing usable percentages of unreduced gametes were found in all sub-populations. These are being used as pollen parents in 4X-2X crosses with commercial tetraploids. A new population of 4000 hybrids was produced and will be evaluated in 1983. Thirty-three tetraploid selections from 1980 4X-2X crosses were evaluated in a replicated field trial. Ten were selected for further trial in the mountains and eight were sufficiently early in maturity and superior in appearance to place in trial in the coastal area. The better clones are outstanding in yield and dry matter. From 1981 4X-2X crosses, 91 clones were selected for further trial.

North Carolina Table 1. Potato trial in Tyrrell County. Plots were 1 row, 24 ft. long, 4 replications of 36 entries in RCB, 32 hills/plot. Spacing in row, 9 inches. Width row, 40 inches. Fertilized: 1000 lb/A 15-10-10 banded. Planted 3/18/82, harvested 6/29/82 (101 days).

Variety	US#1-A cwt/A	Percent US#1-A	Specific Gravity	Chip ^{1/} Color	Appear- ^{2/} ance	Maturity
73C28-4	302	81.8	1.051	6.7	7.0	Med. early
B9455-N9	272	89.8	63	5.3	7.7	Midseason
AF205-9	271	83.4	68	3.7	8.7	Early
Atlantic	271	89.0	71	5.3	8.0	Midseason
72C75-3	265	82.0	58	6.0	7.5	Midseason
AF238-21	261	88.6	55	4.3	7.7	Midseason
73C26-1	249	88.0	67	4.3	8.2	Early
77C15-2	249	85.0	60	5.3	8.0	Med. early
76C29-7	247	76.4	-	5.0	7.2	Midseason
Belchip	245	89.2	65	3.7	7.0	Midseason
Caribe	239	90.2	58	3.3	7.2	Early
NY63	235	91.8	49	5.3	8.0	Late
76C18-4	233	79.5	54	4.3	7.0	Midseason
CF7358-14	233	89.1	57	3.0	8.2	Med. early
CC26-1A	230	93.5	69	5.0	7.5	Midseason
A71.72-1	227	86.7	62	5.7	7.2	Midseason
B9627-N2	225	83.9	63	6.3	7.5	Midseason
Pungo	224	78.5	63	5.3	7.0	Midseason
S377-41	222	84.1	51	7.3	7.2	Med. late
NY68	204	91.5	58	6.0	7.7	Late
AF186-5	202	83.8	67	3.0	8.0	Early
76C2-2	194	74.9	67	5.3	7.0	Midseason
76C29-4	193	87.7	62	5.7	8.5	Early
Norchip	192	81.0	64	3.3	7.0	Med. early
A142.70-2	188	77.4	59	7.7	7.0	Midseason
Allagash R.	184	86.4	59	4.0	7.7	Midseason
S377-8	175	81.0	51	5.3	7.0	Midseason
Rosa	167	74.5	58	4.3	7.0	Late
Jemseg	166	90.7	63	4.7	8.0	Early
ND146-4R	148	81.0	58	4.0	9.0	Early
Bel Rus	137	77.0	62	4.7	8.0	Early
A9.72-1	126	51.5	-	-	6.7	Midseason
Superior	108	86.8	61	5.3	8.5	Early
Chieftan	105	70.4	56	6.7	7.0	Midseason
A63.71-1	94	80.2	49	7.0	7.0	Midseason
Shepody	36	27.6	-	-	5.0	Late
L.S.D. (.05)	63	7.9			0.5	
C.V. (PCT)	22	6.9			4.0	

^{1/} Chip color determined by Wise Foods, Borden, Inc., Berwick, Pa. Average of 5 samples, 1 per week for 5 weeks following harvest. 1-4 acceptable with grade 1 = perfect; 5 useable but not desirable; 6-14 unacceptable with 14 = black.

^{2/} Appearance: 1 = Very Poor; 3 = Poor; 5 = Fair; 7 = Good; 9 = Excellent.

North Carolina Table 2. Potato trial in Pasquotank County. Plots were 1 row, 24 ft. long, 4 replications of 32 entries in RCB, 32 hills/plot. Spacing in row, 9 inches. Width row, 40 inches. Fertilized: 2000 lb/A. 10-10-10. Planted 3/26/82, harvested 6/30/82 (94 days).

Variety	US#1-A cwt/A	Percent US#1-A	Specific Gravity	Chip ^{1/} Color	Appear ^{2/} ance	Maturity
B9484-N1	304	92.9	1.067	4.3	8.0	Med. early
Pungo	300	87.7	64	5.7	7.0	Midseason
73C26-1	288	91.6	64	4.7	9.0	Early
Atlantic	280	92.3	78	3.3	7.5	Midseason
B9455-N9	271	90.0	62	5.7	8.7	Med. early
NY63	266	90.9	51	4.7	7.0	Med. late
Belchip	262	89.3	65	4.0	7.2	Midseason
72C75-3	259	84.7	59	5.0	7.0	Midseason
B9455-N18	259	84.5	61	4.3	8.0	Med. early
NY68	257	90.4	61	4.3	7.7	Late
S377-8	256	87.3	55	4.7	8.0	Med. early
73C28-4	251	83.6	51	7.3	6.7	Midseason
AF238-21	236	87.9	60	4.0	8.0	Midseason
CF7358-14	236	88.4	59	3.7	8.5	Early
Rosa	224	80.4	58	4.0	7.0	Late
75C-4	216	92.0	55	4.3	8.2	Early
Caribe	214	88.2	58	4.0	7.5	Early
77C3-2	208	80.1	61	3.0	8.0	Med. early
76C29-4	208	87.3	53	6.0	8.0	Early
B9336-N3	197	86.1	68	4.0	8.0	Med. early
B9336-N2	197	89.4	68	5.0	7.7	Midseason
S377-41	193	81.2	62	5.7	7.2	Med. late
B9336-N10	180	85.6	60	4.3	8.0	Med. early
Jemseg	176	84.8	61	4.3	8.0	Midseason
Norchip	170	80.3	67	4.0	7.0	Med. early
Allagash R.	159	88.4	54	3.7	8.0	Med. early
Bel Rus	142	77.3	68	2.7	8.0	Early
Shepody	138	66.1	-	-	5.2	Late
ND146-4R	128	63.9	53	2.7	8.5	Early
Superior	109	91.1	65	2.7	8.0	Early
Chieftan	93	80.6	56	5.3	7.0	Midseason
76C11-3	87	80.9	66	5.0	8.5	Early
L.S.D. (.05)	56	6.3		0.5		
C.V. (PCT)	19	5.3		4.1		

^{1/} and ^{2/} See footnotes, North Carolina Table 1.

NORTH DAKOTA

R. H. Johansen, B. Farnsworth, D. Hahn, G. Secor and P. Nolte

Potato Breeding Program

Crossing and Seedling Production. During the late winter and spring of 1982, 263 potato crosses were made in the greenhouse. Breeding emphasized early maturity, yield, specific gravity, good red skin color, russeting, processing qualities and good horticulture characteristics. Parents that were quite well adapted for growing conditions in California were also used in the breeding program. During the summer and fall of 1982, 50,574 seedling tubers were produced in the greenhouse and these tubers will be planted in the spring of 1983 at the Langdon Experiment Station.

Approximately 58,000 seedling tubers were planted in the field at the Langdon Experiment Station in the spring of 1982. Of these seedlings planted, 14,702 were red skinned, 10,602 were russeted and 40,171 were white skinned. The seedlings were planted on May 24 and 25 and harvested on September 13, 14 and 15.

Advanced Selections. In 1982, 823 second-year North Dakota selections were planted in an adaptation plot at Grand Forks and a seed increase plot at Absaraka. In addition, 42 clones selected from seedlings obtained from Texas and Idaho were planted in similar plots. One hundred eighty-three third-year selections and 134 fourth-year selections were planted in adaptation plots at Grand Forks and seed increase plots at Casselton. In a planting at Grand Forks only, 66 cultivars and selections from other states and 45 Texas selections were grown and tested for adaptability and seed increase. The plots at Casselton were planted on May 21 and 22 and harvested on September 27 and 28. The Grand Forks plots were planted on May 24 and 25 and harvested September 7 and 8. An increase and test plot of some of the more promising selections was again planted on the Ralph Mathews farm at Barnesville, Minnesota.

Promising Selections. Line ND146-4R continues to look very promising and probably will be named sometime in 1983. Approximately 800 acres of this selection were grown by certified seed growers in North Dakota and Minnesota during 1982. Line ND146-4R is early in maturity, smooth and has excellent bright red skin color. This selection also has fairly high total solids and is quite high in yield, especially U.S. No. 1 yield. One dark spot on the horizon is the fact that several growers reported a fairly high incidence of Fusarium dry rot after the potatoes were put in storage in the fall of 1982.

Several other selections appear to be quite promising. They are ND388-1Russ, ND534-4Russ, ND55-7, ND657-2, ND651-9, ND649-4R, ND378-1, ND860-2 and ND678-8. Of these, ND388-1Russ and ND534-4Russ have the largest seed increase. Line ND534-4Russ is

a beautiful, russet skin selection that yields quite high and is an exceptionally long, smooth type. Line ND388-1Russ is a russet that is a little more blocky in shape. Line ND388-1Russ might be better for french fries than ND534-4Russ. Lines ND657-2, ND860-2 and ND678-8 are white-skinned selections that chip fairly well out of storage at 43°F.

Cultivar Trials. Twenty-five hills were grown in four replicated blocks at Grand Forks, Park River, Minot and Williston. For general maintenance of the trials, Wayne Grinde was in charge of the Park River trial, while Dennis Askim was in charge of the Grand Forks trial. Superintendents Ernie French and Ben Hoag were in charge of the Williston and Minot trials, respectively, (North Dakota Table 1). At the Grand Forks and Park River trials, 25 entries were tested, while at Minot and Williston, 13 entries were tested. Marketable yield consisted of all U.S. No. 1 tubers over 1-7/8 inches in diameter. Specific gravity was determined by the use of a potato hydrometer.

In addition to the state trials, nine russets, nine whites and five red selections were planted on a 20-hill replication trial at Grand Forks. The North Central trial was also planted at Grand Forks and will be summarized in another report.

Spacing, fertilizer, soil type, planting and harvest dates of the 1982 trials are found in North Dakota Table 1.

The growing season was somewhat dry and erratic throughout most of the Red River Valley. For example, Grand Forks received about seven inches of precipitation from May 1 through August. However, Park River received heavy rainfall in early July and was quite wet throughout most of the season. Park River also received damaging hail several times during the season. In June, a heavy rainfall in eastern Walsh County caused severe flooding and damage to the potato crop. In most cases temperatures were quite cool throughout the growing season. Rainfall and temperatures were quite variable in western North Dakota. It was extremely wet in the spring but quite dry in July and August. A record snowfall of 25.3 inches was received at Minot during January and this attributed to the very wet spring. Temperatures in western North Dakota were also below normal until August when temperatures reached the 90's.

The trial at Park River produced the highest yield in the Red River Valley trials. The average yield of all entries grown at Park River was 195 cwt/A, compared to Grand Forks with an average yield of 175 cwt/A. Yields in western North Dakota were quite comparable at Minot and Williston and were generally very low. The low yield, no doubt, was due to the variable temperatures and low rainfall during a critical time of growth.

Lines ND258-1, Crystal, Red Pontiac and ND146-4R were the highest yielding entries in the Red River Valley trials (North Dakota Table 2). In U.S. No. 1 yields, ND146-4R averaged only 6 cwt/A less than Red Pontiac and 95 cwt/A more than Norland.

The two promising russet selections, ND388-1Russ and ND534-4Russ produced U.S. No. 1 yields much higher than Norgold Russet, Lemhi and Russet Burbank. The clone, RB 307, yielded less than Russet Burbank and was very poor in appearance. Lines ND651-9 and ND55-7, two outstanding chipping selections outyielded both Kennebec and Norchip in U.S. No. 1 yield and also had excellent tuber shape, type and total solids.

In the trials at Minot and Williston in western North Dakota, Red Pontiac, Kennebec, Crystal and ND388-1Russ were the highest yielding entries. However, yields averaged from 103 cwt/A for Red Pontiac down to 44 cwt/A for RB 307 (North Dakota Table 3).

Line ND722-2Russ, with an average of 23.5 percent total solids, was the highest in the Red River Valley trials. Unfortunately, this selection also produced the lowest yield among the 25 entries in the trial. Line TND22-2, Norchip, ND55-7, ND731-6R and ND388-1Russ were the next highest entries in total solids (North Dakota Table 2). The Grand Forks trial produced slightly higher total solids than the Park River trial. Lower rainfall at Grand Forks probably was beneficial for the higher total solids.

In the trial at Grand Forks consisting of new advanced selections, ND967-1Russ, ND860-2 and ND678-8 were the highest yielding entries (North Dakota Table 4). Line ND967-1Russ has good type but is lacking in total solids, while ND860-2 has good type, total solids and excellent chipping qualities, both out of 43° F storage and after reconditioning. Line ND649-4R has excellent red color, high solids and good type. Several of these selections will be tested in the statewide trials during 1983 (North Dakota Table 4).

Processing Tests - Chipping. From the selections grown in 1981, 198 second-year selections were screened for chip quality during the winter of 1982. Of these selections four had Agtron readings ranging from 46 to 48; 27 had Agtron readings between 40-45 and 30 selections had Agtron readings ranged from 35 to 39. All of these selections can be considered as possible chipping cultivars providing other characteristics are satisfactory. Chipping tests for cultivars and selections grown in trials at Park River and Grand Forks are reported in North Dakota Table 5. After reconditioning for four weeks, ND445-1 and ND612-9 had excellent chip color. In similar tests Crystal chipped comparably to Kennebec and Norchip. Line ND55-7 produced fairly light chips after reconditioning for four weeks.

Culinary Tests. Culinary tests are reported in North Dakota Table 6. In the baking tests both oven and microwave are reported, however, there seemed to be little difference between the two tests. Sloughing was again found in the selections and cultivars which had high dry matter. Test scores for trials grown at Park River and Grand Forks were averaged.

Frozen French Fry and Flake Tests. Samples for french fries and flakes were again prepared by the Potato Research Processing Center at East Grand Forks and are reported in North Dakota Table 7. Twenty four selections and cultivars were tested for french fries, however, several selections were dropped from the program and these are not included in North Dakota Table 7. The same situation occurred for flakes where 15 were tested but only 13 are included in North Dakota Table 7. Sensory tests for quality were conducted by the Food and Nutrition Department at North Dakota State University. Several selections and Crystal produced better quality than Russet Burbank grown at Grand Forks. Dakchip, Crystal, ND55-7, ND119-3 and ND537-8Russ produced flake quality better or equal to the check variety, Norchip.

Disease Control and Resistance. Approximately 900 second year, 250 third year and 120 fourth year selections were evaluated for scab and silver scurf resistance at the Potato Research Farm, Grand Forks. Many selections appeared to have excellent resistance to scab and silver scurf. Over 50% of the selections showed some resistance to both of these diseases.

Approximately 850 second year selections were grown in a potato free area (Absaraka) and evaluated for disease and horticultural characters. Diseased selections were removed and superior selections saved for further observation and indexing.

Approximately 500 advanced selections were greenhouse grown and read visually for tuber borne diseases. These selections were also indexed for spindle tuber using gel electrophoresis and PVX using serology. None were found to be infected with PVX and only a few were found to be infected with PSTV. An unusually large number of selections were discarded because of mosaic. Most of the mosaic was caused by PVY. It was suspected, and later confirmed, that the PVY originated from selections which were latent (symptomless) carriers of PVY. The disease free selections were maintained at the Agronomy Seed Farm, Casselton, as a source of clean seed for breeding and other purposes.

Approximately 30 selections were indexed for disease and released to growers in Beach, North Dakota for increase as part of the basic seed stock program.

Representative tubers of 500 second year and advanced selections were grown in Florida for winter indexing of virus diseases (cooperator, Doug Johansen, State Seed Department).

Twenty-six advanced selections were evaluated for resistance to late blight (race 0) in both foliage and tuber tissue. Only 14-6R and TND22-2 were resistant to late blight in both foliar and tuber tissue. Four other selections, 398-1, 664-12R, 689-3 and 860-2, exhibited resistance in tuber tissue but only moderate resistance in foliar tissue.

In an additional 8 selections, resistance to late blight was observed only in tuber tissue but not foliar. One of the most

outstanding advanced selections, 146-4R, has good late blight resistance in both tuber and foliar tissue and, based on widespread field data, appears to have excellent resistance to scab and silver scurf. This selection is susceptible to Verticillium and Fusarium dry rot. This selection will be released soon as a named cultivar. Problems with postharvest bruise and dryrot were seen in some areas for the first time this year.

North Dakota Table 1. Spacing, fertilizer, soil type, planting and harvest dates of the 1982 trial.

Location	Spacing		Fertilizer	Soil Type ^{1/}	Planting Date	Harvest Date
	Row (in.)	Plant (in.)				
Park River	38	12	Fall application	Bearden SL	5/25	9/20
Grand Forks	38	12	200# 20-20-12	Bearden CL	5/24	9/23
Minot	36	14	60# N/A	Williams L	5/26	10/4
Williston	38	16	150# 34-0-0	Sandy L	6/1	10/8
			50# N/A			

1/ L - Loam
 SL - Silt Loam
 CL - Clay Loam

North Dakota Table 2. U.S. No. 1 Yield, Percent U.S. No. 1 and Total Solids of Potato Cultivars Grown in the Red River Valley Trials, 1982.

Cultivar	Grand Forks				Park River				Average	
	Cwt/A		%		Cwt/A		%		U.S. No. 1	Total Solids
	U.S. No. 1 Yield	U.S. No. 1	U.S. No. 1	Total Solids	U.S. No. 1 Yield	U.S. No. 1	U.S. No. 1	Total Solids		
ND258-1	256	92	22.4	21.2	246	75	251	21.8	84	21.8
Crystal	213	91	21.8	20.5	286	82	250	21.2	87	21.2
Red Pontiac	229	92	19.7	18.2	270	87	250	19.0	90	19.0
ND146-4R	230	98	21.2	19.9	257	90	244	20.5	94	20.5
ND9403-16R	196	90	22.0	19.9	256	89	226	20.9	90	20.9
ND388-1Russ	188	86	23.5	20.7	251	87	220	22.2	87	22.2
ND651-9	241	93	22.2	21.4	190	77	216	21.8	85	21.8
ND534-4Russ	193	85	22.0	20.3	228	86	211	21.2	86	21.2
ND55-7	217	85	23.7	21.2	202	78	210	22.4	82	22.4
ND731-6R	184	94	22.9	21.6	233	89	209	22.2	92	22.2
ND294-1R	190	91	21.2	20.1	211	82	201	20.7	87	20.7
ND372-2R	193	91	22.2	20.9	200	83	197	21.6	87	21.6
ND463-1R	188	91	22.0	19.9	196	86	192	21.4	89	21.4
TND22-2	170	86	24.6	21.8	178	81	174	23.3	84	23.3
Norgold Russet	161	75	21.6	20.1	182	79	172	20.9	77	20.9
Kennebec	145	77	20.9	18.6	196	64	171	19.9	71	19.9
Lemhi	116	70	22.9	20.3	219	81	168	21.6	76	21.6
Bison	166	90	20.7	18.8	143	84	155	19.9	87	19.9
Norchip	170	82	23.5	21.8	140	70	155	22.7	76	22.7
Red Norland	173	88	19.4	18.8	126	84	155	19.2	86	19.2
Russet Burbank	114	67	21.8	21.2	178	63	146	21.6	65	21.6
ND748-3Russ	136	87	20.5	19.4	116	78	126	20.1	83	20.1
RB307	88	58	22.0	20.7	162	70	125	21.4	64	21.4
ND119-3	138	81	20.1	18.0	111	80	125	19.0	81	19.0
ND722-2Russ	89	51	24.6	22.2	102	53	96	23.5	52	23.5
Average	175	82	22.0	20.3	195	79	186	21.2	82	21.2

North Dakota Table 3. Total Yield, U.S. No. 1 Yield, Percent U.S. No. 1 and Total Solids of Potato Cultivars and Selections Grown in Western North Dakota Trials.

Cultivar	Minot				Williston				Average			
	U.S.		%		%		%		%		%	
	Total Yield	No. 1 Yield	Solids	%	Total Yield	No. 1 Yield	Solids	%	Total Yield	No. 1 Yield	Solids	%
Bison	99	69	22.2	70	96	80	22.4	83	98	75	22.3	77
Crystal	121	81	24.4	67	133	112	25.7	84	127	97	25.1	76
Kennebec	125	93	23.3	74	127	112	24.2	88	126	103	23.8	81
Lemhi	124	72	24.0	58	130	101	23.5	78	127	87	23.8	68
Norchip	94	61	24.4	65	86	73	24.6	85	90	67	24.5	75
Norgold Russet	110	61	22.9	55	115	93	23.5	81	113	77	23.2	68
Red Norland	97	68	21.6	70	109	95	21.6	87	103	82	21.6	79
Red Pontiac	118	88	20.9	75	134	124	21.8	93	126	106	21.4	84
Russet Burbank	110	43	23.3	39	126	86	23.5	68	118	65	23.4	54
RB 307	115	32	22.7	28	102	56	22.7	55	109	44	22.7	42
ND146-4R	113	76	21.6	67	115	92	22.2	80	114	84	21.9	74
ND388-1Russ	119	85	23.5	71	132	101	23.7	77	126	93	23.6	74
ND534-4Russ	113	73	23.3	65	118	90	23.1	76	116	82	23.2	71
Average	112	69	22.9	62	117	93	23.3	80	115	82	23.1	71

North Dakota Table 4. Russet, Red and White-Skinned Selections Grown at Grand Forks, North Dakota, 1982.

Cultivar	Cwt/A	Percent U.S. No. 1	Specific Gravity	Percent Total Solids
ND967-1Russ	204	83	74	18.4
ND860-2	194	88	89	21.6
ND678-8	190	76	87	21.2
ND791-5R	185	82	76	18.8
ND1086-7R	185	89	82	20.1
ND19-3Russ	182	80	92	22.2
ND779-4	179	84	89	21.6
ND649-4R	178	85	92	22.2
ND398-1	176	85	95	22.9
ND800-4Russ	176	86	81	19.9
NDT5-15-1Russ	166	73	94	22.7
ND657-2	162	66	92	22.2
ND664-12R	162	80	81	19.9
ND1010-7	159	81	96	23.1
ND689-3	153	70	94	22.7
ND1028-3R	151	76	80	19.7
ND843-5Russ	145	79	87	21.2
ND671-3Russ	143	86	82	20.1
ND906-11	133	69	87	21.2
ND392-4Russ	132	75	70	17.5
ND698-1	124	69	90	21.8
ND537-8Russ	114	64	89	21.6
ND606-4Russ	68	60	84	20.5
Average	159	78	83	21.0

North Dakota Table 5. 1982 Chip Tests of Cultivars and Selections Grown at Grand Forks and Park River-1981.

Cultivar	Agtron			Agtron			Agtron			Percent yield		
	0 weeks 40° F			2 weeks 68° F			4 weeks 68° F			average 3 tests		
	Grand	Forks	River	Grand	Forks	River	Grand	Forks	River	Grand	Forks	River
Bison	14.0	14.0	12.8	27.0	27.0	33.5	33.3	33.3	39.8	31.0	31.0	30.4
Crystal	16.5	16.5	24.8	29.0	29.0	33.8	38.0	38.0	52.8	33.9	33.9	34.9
Kennebec	14.3	14.3	20.5	21.3	21.3	46.5	34.0	34.0	50.8	32.0	32.0	34.1
Lemhi	15.8	15.8	18.5	26.3	26.3	35.3	40.0	40.0	47.5	34.7	34.7	36.4
Norchip	14.5	14.5	15.8	33.5	33.5	35.0	39.5	39.5	50.3	34.8	34.8	34.4
Russet Burbank	16.0	16.0	15.5	25.8	25.8	32.0	29.3	29.3	42.8	34.2	34.2	35.4
TND14-1Russ	13.0	13.0	12.3	22.8	22.8	27.5	35.8	35.8	34.0	34.1	34.1	32.1
ND55-7	14.3	14.3	13.0	27.3	27.3	34.5	36.5	36.5	52.5	35.0	35.0	34.6
ND146-4R	11.3	11.3	10.3	27.0	27.0	28.3	34.0	34.0	22.3	32.9	32.9	32.0
ND258-1	17.8	17.8	17.5	41.8	41.8	32.5	48.0	48.0	36.8	34.6	34.6	33.4
ND388-1Russ	14.5	14.5	19.5	30.3	30.3	36.5	34.0	34.0	40.0	34.4	34.4	34.6
ND445-1	11.5	11.5	15.5	47.3	47.3	52.3	50.5	50.5	55.3	32.0	32.0	32.3
ND467-3	14.5	14.5	15.3	31.0	31.0	21.0	31.5	31.5	29.0	32.9	32.9	30.3
ND534-4Russ	13.8	13.8	14.3	34.0	34.0	33.7	33.5	33.5	37.5	32.8	32.8	34.2
ND612-9	21.0	21.0	30.8	47.3	47.3	34.0	54.0	54.0	53.5	34.3	34.3	33.7
ND632-5	18.0	18.0	14.0	37.3	37.3	30.0	47.8	47.8	41.8	34.4	34.4	34.7
ND9403-16R	16.3	16.3	13.8	35.3	35.3	31.0	50.8	50.8	33.3	32.2	32.2	32.0
Average	15.1	15.1	16.7	32.6	32.6	33.9	39.4	39.4	42.4	33.5	33.5	33.5

North Dakota Table 6. 1982 Cooking Tests of Cultivars and Selections Grown at Grand Forks and Park River, 1981^{1/}.

Cultivar	Boiling				Baking (Oven)				Baking (Microwave)			
	Slough- ing	Meali- ness	Color immed. after cooking	Color 4 hours after cooking	Flavor	Meali- ness	Color	Flavor	Meali- ness	Color	Flavor	
Bison	10.0	4.4	8.5	6.5	7.6	6.0	9.3	7.4	5.5	9.3	7.1	
Crystal	7.5	9.1	9.5	9.0	8.4	7.9	9.8	8.0	9.3	10.0	8.1	
Kennebec	9.3	7.1	8.8	8.5	7.6	6.8	9.3	7.3	8.5	9.8	8.6	
Lemhi	6.8	8.0	8.0	8.5	8.6	8.0	9.3	7.5	8.8	10.0	8.6	
Norchip	9.0	7.8	9.0	8.3	7.8	6.8	9.0	7.4	8.0	9.8	8.0	
Norgold Russet	8.5	7.8	8.8	8.5	7.8	7.8	10.0	7.6	8.5	10.0	8.8	
Norland	9.5	6.1	9.3	8.3	7.6	6.4	8.8	6.9	6.3	9.8	8.0	
Red Pontiac	9.0	5.9	8.8	9.0	7.9	6.5	8.0	6.8	6.3	9.8	7.3	
Russet Burbank	8.3	8.9	8.5	9.3	8.5	7.6	8.8	7.8	8.5	10.0	8.5	
TND14-1Russ	6.5	8.4	8.8	9.3	8.3	7.3	9.8	7.9	7.5	10.0	7.1	
ND55-7	7.3	8.1	8.0	8.8	8.4	8.0	8.8	8.3	6.9	10.0	7.6	
ND115-21R	9.8	4.8	8.5	9.5	5.0	5.6	7.3	4.6	6.9	9.5	7.3	
ND146-4R	8.3	5.9	8.8	7.3	6.9	5.6	9.0	7.1	7.0	9.8	8.0	
ND206-1R	9.5	5.8	8.8	9.0	7.6	6.0	8.3	7.3	6.3	9.3	7.0	
ND258-1	7.0	8.4	8.3	8.5	8.3	8.0	9.8	8.1	7.3	9.8	8.5	
ND294-1R	8.5	6.3	9.5	8.0	7.5	5.9	8.0	6.8	6.6	9.3	7.6	
ND372-2R	7.0	8.4	9.3	8.0	7.9	6.8	9.8	7.9	7.6	10.0	8.1	
ND388-1Russ	7.8	9.1	7.3	7.3	8.4	8.8	9.3	8.6	7.5	9.8	7.5	
ND445-1	8.8	6.4	7.3	6.5	7.8	6.6	8.3	6.1	7.5	9.3	7.4	
ND463-1R	9.8	6.3	7.8	6.0	7.4	6.5	8.0	7.6	6.9	9.8	7.6	
ND467-3	9.3	5.8	9.5	7.8	7.1	7.4	9.3	7.0	6.8	9.8	7.5	
ND534-4Russ	7.3	8.8	6.8	8.3	8.6	8.5	8.3	7.5	8.3	9.0	8.5	
ND612-9	9.8	7.3	8.3	7.8	7.0	6.8	8.3	7.4	8.3	9.8	8.3	
ND632-5	8.5	7.5	7.8	8.3	7.3	7.5	8.5	7.0	7.6	9.0	7.0	
ND9403-16R	9.5	6.3	8.3	8.5	7.4	5.9	7.8	6.1	5.9	9.8	6.4	
Average	8.5	7.2	8.5	8.2	7.7	7.0	8.8	7.3	7.4	9.7	7.8	

1/ Average of two locations (Grand Forks and Park River).

North Dakota Table 7. French Fry and Flake Tests of Potato Selections and Cultivars Grown in the 1981 Trials^{1/}.

Cultivar	Color ^{2/}	Texture	Flavor	Average All Totals
<u>FRENCH FRIES</u>				
ND689-3	8.10	7.71	7.77	7.86
ND537-8Russ	7.16	7.76	7.59	7.50
Crystal	7.46	7.27	7.64	7.46
ND678-8	7.72	7.00	7.45	7.39
ND119-3	7.61	7.45	7.06	7.37
ND457-17	7.61	7.25	7.22	7.36
Ore-Ida	7.33	7.07	7.51	7.30
ND55-7	7.23	7.43	6.91	7.19
ND651-5	7.58	7.20	6.52	7.10
ND671-2Russ	6.78	7.22	7.28	7.09
ND445-1	7.83	7.17	6.22	7.07
ND612-9	7.67	7.30	6.22	7.06
ND467-3	7.74	6.76	6.40	6.97
Lemhi	6.74	7.10	6.88	6.91
ND455-1Russ	6.78	6.50	7.37	6.88
ND450-11Russ	6.72	6.50	6.83	6.68
TND14-1Russ	6.24	7.01	6.79	6.68
ND433-5	6.39	6.22	6.78	6.46
ND657-2	6.89	6.55	5.94	6.46
ND770-4Russ	6.37	6.74	6.19	6.43
ND722-2Russ	5.90	6.54	6.31	6.25
ND388-1Russ	5.83	5.50	6.00	5.78
Russet Burbank	5.56	6.34	5.15	5.68
Viking	5.25	5.59	4.85	5.23
AVERAGE	6.94	6.88	6.70	6.84
<u>POTATO FLAKES</u>				
Dakchip	7.14	7.11	7.14	7.13
ND55-7	7.28	6.95	6.78	7.00
Crystal	7.05	6.97	6.92	6.98
ND119-3	7.25	6.83	6.83	6.97
ND537-8Russ	7.16	6.69	6.97	6.94
Norchip	6.90	6.88	6.92	6.90
ND146-4R	6.95	6.83	6.80	6.86
ND413-4	7.22	6.39	6.64	6.75
TND22-2	7.20	6.39	6.64	6.74
Russet Burbank	6.97	6.47	6.72	6.72
ND445-1	6.75	6.28	6.72	6.58
ND722-2Russ	6.75	6.00	6.72	6.49
Lemhi	7.17	5.94	6.31	6.47
ND612-9	5.81	6.19	6.14	6.05
ND388-1Russ	5.42	5.78	4.06	5.09
AVERAGE	6.87	6.51	6.55	6.64

^{1/} RATING GUIDE: 7-9 (Good); 5-6 (Fair, but acceptable); 1-4 (Poor, not acceptable)

^{2/} Not treated for color correction on french fry score.

OHIO

J.M. Pisarczyk, R.C. Rowe, E.C. Wittmeyer, F.I. Lower, W.A. Gould, and D.M. Kelly.

Over 60 potato varieties and advanced selections were evaluated in trials across Ohio in 1982. These trials included: 1) a Statewide Trial of 10 entries located on six commercial farms, 2) an Observation Trial of many newer entries located on two of the six commercial farms, and 3) a trial of 10 entries at the OARDC Muck Crops Branch at Celeryville.

There were 10 entries evaluated at six commercial farms located across the state. Of those entries, eight (Rosa, Neb. Al29.69-1, W 718, Denali, NY 59, Jemseg, Belchip, and Russette) were included because they have looked promising in previous years, and the other two entries (Norchip and Katahdin) were included as standards. Katahdin was included for comparison as a standard midseason variety, and Norchip was included as a standard for comparison of chipping material.

The Statewide Trials on six commercial farms were subjected to standard cultural and pest control practices used on those farms. Plots consisted of double rows approximately 40 feet long (80 seedpieces) and entries were replicated four times. Stand, vigor, and disease were evaluated at certain farms during the growing season. The observation plots were on two of the six farms that had the main plots. Plot size consisted of double rows approximately 25 feet long (50 seedpieces).

High yields were produced by NY 59, but the internal necrosis problem might limit its use in Ohio. Above-average yields of attractive tubers were produced by W 718. It has a slight tendency to hollow heart, but continues to be a promising fresh-market cultivar. Rosa produced above-average yields in Ohio, but while the red splashes around the eyes of tubers are distinctive, they will probably limit its use in Ohio. High yields of very attractive tubers are usually produced by Neb. Al29.69-1 in Ohio. Tuber quality is excellent. It is a promising fresh-market cultivar. Denali is quickly expanding in commercial production in Ohio because of above-average yields and high tuber specific gravity. Jemseg shows promise as an early maturing fresh-market cultivar in Ohio. Russette and Belchip will probably not gain commercial acceptance in Ohio. (OHIO Tables 1 and 2)

The five highest yielding cultivars in the Observation Trial were BR5991-WV16, BR7093-23, CA 02-7, W 738, and AK 114. In 1982, BR5991-WV16 led in yield. It has a tendency to internal necrosis. In 1982, AK 114 and BR7093-23 had above-average yields. In Statewide Trials in 1980, CA 02-7 had very low yields, but has looked promising in some years. Other cultivars of interest include Chipbelle which has average yields, but high tuber specific gravity. Simcoe and Conestoga are early-maturing cultivars and will be tested more in Ohio.

Belrus-type russets included B8934-4, B8972-1, and B8943-4, but they did not yield much better than BelRus. (OHIO Table 3)

In the Muck Trials, NY 59, Belchip, Neb. A129.69-1, and W 718 produced the highest yields. There was no internal necrosis shown in NY 59 tubers. This was the first year it was in the trial on muck. Belchip had good shape and few culls on the muck. In this trial, Neb. A129.69-1 has generally had low yields. This year W 718 had an excellent yield and had led in yield for six years in this trial. Denali has generally produced low yields on muck soils. The cultivars with the most hollow heart in tuber samples were Russette, 56%; W 718, 52%; Jemseg, 32%; and Neb. A129.69-1, 30%. (OHIO Table 4)

Ohio Table 1. Average U.S. No. 1 yields, grade, and stands - Statewide Trial, 1982.

Entry	Average Yields	Average Percent			Average % stand
	Cwt/ A	U.S. No.1	B size	culls	
NY 59	388	92.1	3.8	4.1	90.1
W 718	373	92.5	3.2	4.3	80.7
Katahdin	341	91.2	4.2	4.6	90.3
Rosa	337	84.9	7.0	8.1	84.3
Neb. A129.69-1	327	89.8	4.8	5.4	85.5
Denali	311	87.1	6.4	6.5	76.2
Jemseg	300	89.6	3.4	7.0	81.5
Russette	284	89.6	4.4	6.0	76.5
Norchip	274	82.9	6.5	10.5	84.3
Belchip	264	80.6	2.5	16.9	66.6
Average	320	88.0	4.5	7.4	81.6

Ohio Table 2. Percent of total tubers cut showing hollow heart and internal necrosis. Statewide Trial (Only greater than 1% shown)

Entry	H.H.	Nec.	Entry	H.H.	Nec.
NY 59	-	13.8	Denali	2.5	-
W 718	2.7	8.0	Jemseg	-	-
Katahdin	-	5.5	Russette	4.0	-
Rosa	-	-	Norchip	-	7
Neb. A129.69-1	-	-	Belchip	2.1	-

Ohio Table 3. Yield, grade, and tuber size of Observation Trial entries, 1982.

Entry	Yield (cwt/A)	% US No.1	Tuber weight (oz)
BR5991-WV16	431	91.4	5.8
BR7093-23	392	90.4	6.0
CA 02-7	388	91.0	5.8
W 738	373	89.6	6.4
AK 114	362	87.4	5.5
Alasclear	362	85.8	5.8
AF 186-5	360	89.4	6.1
Kennebec	359	81.2	6.8
AK 28	354	90.8	5.8
ND 146-4R	346	93.4	5.2
AK 38-2	342	85.1	5.7
AK 10-1	324	81.2	6.5
Superior	319	90.0	5.9
Simcoe	318	88.0	5.4
CC 26-1A	310	84.4	6.0
Neb. A71.72-1	305	88.8	6.0
Chipbelle	304	92.1	5.8
Neb. 51-3	291	79.8	6.6
AK 13-5	273	77.6	6.9
Conestoga	266	82.7	5.4
ND 55-7	264	86.3	5.0
B 8934-4	235	79.7	6.4
Minn. 8224	234	85.0	5.8
Minn. 7973	233	80.4	6.2
B 8972-1 (Goldrus)	196	71.2	5.8
BelRus	187	74.8	4.6
B 8943-4	178	78.9	5.7

Ohio Table 4. Yield and grade characteristics of entries of Celeryville Muck Trials, 1982.

Entry	Total	U.S. # 1	U.S. # 1	B-Size	Cull	H.H.	Nec.
N							
NY 59	563	530	94.0	3.6	22.3	4.0	0
Belchip	505	475	94.1	2.3	3.6	0	0
Neb.A129.69-1	493	468	94.8	3.2	2.0	30.0	0
W 718	459	444	94.7	2.8	2.5	52.0	0
AK 114	500	442	88.4	8.8	2.8	0	0
Jemseg	450	423	94.0	1.9	4.1	32.0	0
Rosa	466	410	87.9	9.2	2.9	16.0	0
Katahdin	412	388	94.2	4.3	1.4	20.0	0
Denali	437	388	88.9	6.3	4.8	20.0	0
Russette	334	251	75.2	7.6	17.2	56.0	0

OREGON

A.R. Mosley, D.C. Hane, M. Johnson, C. Stanger, G. Carter and S. James

Introduction

Thirteen varietal evaluation plantings were made by the authors in 1982. Data from selected Columbia Basin and Willamette Valley plantings will be summarized in this report. Additional varietal information for the Klamath Basin, Central Oregon and the Ontario area can be obtained from the authors.

Columbia Basin Trials

Statewide Trial. Forty-five selections were compared in the Hermiston segment of the Statewide Trial at the Columbia Basin Agricultural Research Center, Hermiston. Seed pieces were planted nine inches apart in loamy fine sand on April 6, vines were sprayed with dinitro on September 3 and 13, and tubers were harvested on September 28.

Pest control and cultural practices closely followed commercial practices in the area. Plots were fertilized at the rate of 100 N, 100 P₂O₅, 175 K₂O and 60 pounds of sulfur per acre at planting. Additional nitrogen was added on June 2 (50 lbs/acre), June 17 (50), July 4 (50) and July 19 (50 lbs N/acre).

Eptam was applied pre-emergence and Sencor post-emergence ($\frac{1}{2}$ lb ai/acre) for weeds. Dyfonato, Temik and Monitor were used as recommended for insect control.

Yield and quality determinations showed several selections to be extremely promising but none superior to Russet Burbank on all counts (Table 1). Lemhi produced high yields of attractive tubers which fried light; however, it is known to have serious storage problems. A69870-3 looked extremely promising in 1982 as did A71997-8, A74393-1 and ND385-4. A7242-3, A72685-2 and A74212-1 seemed to have promise for fresh market. All of the above and other selections will be tested further in 1983.

On-Farm Trials. Varietal tests were conducted on four commercial farms under center-pivot irrigation. Plots were planted with an assisted-feed planter, dug by level-bed digger and hand-picked. The crops were grown using cultural and pest control practices common to the remainder of the field(s). Average results for the four tests are summarized in Table 2.

Characteristics of Butte, Lemhi, Russet Burbank and Targhee have been well documented. Lemhi is excellent for early

processing from the field and fries much lighter and generally has higher solids than Russet Burbank. It is, however, unpredictable in storage from the standpoint of blackspot bruise and decay. Butte and Targhee are suitable only for fresh market and will meet only very limited success in Oregon.

A69870-3 seemed to be particularly promising in 1982. It yielded well, was generally attractive and produced light-colored french fries in the Hermiston segment of the state-wide trial. A74393-1 also showed some promise for processing but tubers were rougher than those of A69870-3. AD74135-1 did not perform well in that tubers were rough-shaped and fries were dark (see Table 1).

Willamette Valley Trial

Fourteen varieties and selections were compared on silt loam soil at Corvallis (Table 3). Seedpieces were planted nine inches apart in single-row plots 25 feet long, replicated four times, on May 13. Fertilizer was broadcast prior to planting at the rate of 468 lbs per acre of 16-16-16; approximately 537 lbs/acre of the same carrier was banded at planting. Sencor was applied at recommended rates pre-emergence. Insects and diseases were controlled as needed. Plots were harvested on September 21.

Yields and quality varied widely. Norchip yielded and graded very poorly, but chip color was relatively good on December 15. All chips were darker than normal due to cold and variable storage conditions prior to frying.

WC521-12, Atlantic and Rosa yielded higher than Norchip and seemed to chip about as well. Although scab was not a problem in this test, Rosa was extremely susceptible to this disease in Central Oregon. It probably should not be grown in scabby soils. ND534-1 Rus and ND388-4 Rus seemed to have fresh market potential as did the two reds ND146-4R and Sangre.

WC521-12 seemed to be the most promising new selection for Willamette Valley conditions. Further field, storage and frying tests are necessary before it can be recommended to growers, however.

Oregon Table 1. Yield and Quality of 45 Potato Varieties and Selections, Hermiston STATEWIDE TRIAL, 1982.

Entry	Yield, Cwt/A		Specific Gravity	Percent ^{2/}			Fry Color	% Sugar ^{3/} Ends	Comments ^{4/}
	Total	No. 1		Scab	Shatter	HH			
Lemhi	819	750	1.087	1	8	16	0.7	4	Fair. Oblong. Rus.
A68678-2	685	590	1.076	0	7	1	3.1	92	Good. Blocky Rus. Lge.
A69827-15	624	495	1.075	0	16	2	2.2	60	Poor. Rough. Lt. Rus.
A69870-3	754	723	1.082	0	9	3	1.1	0	Good. Round Rus.
A70286-2	514	357	1.082	0	9	8	2.0	28	Poor. Oblong Med. Rus.
A71875-9	705	497	1.073	0	26	5	3.5	100	Poor. Dark Rus. GC, EH
A71991-3	390	263	1.078	0	3	4	3.1	88	Small. Oblong Rus. GC
A71991-5	566	469	1.078	0	29	2	2.7	92	Smooth. Blocky Rus. Fair
A71996-4	581	512	1.082	0	14	1	1.6	24	Blocky, Immature Lt. Rus.
A71997-8	779	718	1.082	0	43	0	1.8	0	Flat, Oblong Med. Rus. Mat.
A711017-6	384	278	1.070	0	33	3	1.8	12	Poor. Round Rus. GC
A7242-3	705	670	1.085	0	2	1	2.9	92	Round. Flat Lt. Rus.
A7279-12	723	598	1.094	0	6	0	1.1	4	Poor. Lge. Flat Rus. Deep Eyes
A72602-2	574	484	1.091	0	17	5	0.8	0	Fair. Round Dark Rus. Mature
A72545-25	748	644	1.084	0	68	2	3.7	100	Poor. Lge. Blocky Rus.
A72649-7	668	598	1.079	0	9	0	2.0	52	Fair. Oblong Lt. Rus.
A72685-2	902	804	1.088	2	23	1	2.8	88	Fair. Round Med. Rus.
A7413-2	633	524	1.090	12	16	1	1.1	8	Poor. Lge. Rough, Deep Eyes
A7425-5	1023	603	1.083	0	23	1	3.0	60	Poor
A74123-7	808	652	1.085	0	10	2	2.3	60	Poor. Med. Rus. Rough
A74129-4	564	474	1.089	2	9	6	2.2	36	Good Round-Oblong Rus.
A74142-4	750	720	1.072	0	10	0	3.2	84	Flat, White
A74154-2	517	472	1.077	0	46	0	1.9	4	Oblong Lt. Rus. Fair-Good
A74212-1	899	733	1.077	0	10	0	2.7	80	Lt. Rus. Immature, Skinning
A74265-11	806	675	1.085	0	16	12	2.0	16	Discard. Oblong, Med. Rus.
A74393-1	832	732	1.078	0	3	25	0.8	0	Good. Flat, Oblong, Dark Rus
A74443-1	567	469	1.084	0	4	1	1.1	20	Discard. Long, Pointed, Lt. Rus.
A74445-2	626	495	1.090	0	5	0	0.4	8	Fair-Good. Blocky Rus. Minor GC
A7508-20	287	234	1.078	0	47	0	2.6	56	Sensor Inj. Shatter. Disc.
A75512-3	696	543	1.079	0	1	2	0.3	0	Lge. Med. Rus. Minor GC
A76116-3	477	430	1.088	4	17	1	0.8	20	Sensor Inj. Blocky Lt. Rus.
A76118-3	720	640	1.083	7	16	0	1.6	20	Oblong White. Immat. Scab

Oregon Table 1 - continued

Entry	Yield, Cwt/A		Specific Gravity	Percent ^{2/}			Fry Color	% Sugar Ends	Comments ^{4/}
	Total	No. 1		Scab	Shatter	HH			
AD74135-1	889	472	1.079	9	9	2	3.3	100	Poor. Lg. Rus. Bottle Necks
AK13-5	501	367	1.092	1	5	10	2.1	36	Discard. Oblong White GC
ND385-4	782	712	1.079	0	0	0	2.1	28	Lt. Rus. Flat, Blocky
ND415-1	695	530	1.085	0	13	6	2.2	28	Poor. Deep Eyes. Rus.
ND681-3	674	572	1.084	0	3	1	-	-	Smooth, Lt. Rus. Oblong
ND681-4	628	586	1.079	0	35	9	2.6	76	Blocky Lt. Rus. Sever GC, Shatter
ND728-3	673	613	1.075	0	10	0	0.9	0	Fair. Oblong, Flat Rus.
ND770-3	474	318	1.079	0	27	0	2.4	100	Long, Thin. Med. Rus.
ND776-7	496	374	1.075	0	20	0	1.8	16	Fair. Round-Blocky. Lt. Rus.
T549-1	678	581	1.089	0	3	0	2.0	88	Flat. Pear-Shaped. GC
T573-2	843	667	1.074	25	0	2	2.1	20	Blocky, Lt. Rus. Immat. GC. Scab
Norgold	613	555	1.084	0	13	6	2.8	72	Smooth, Oblong Rus. Good
80VT-SC									
R. Burbank	815	620	1.083	0	11	0	2.5	40	Lge. Ugly. Deep Eyes. Poor
LSD, 0.05	200	78	-	-	-	-	-	-	-

1/ Specific gravities determined by potato hydrometer.

2/ HH = hollow heart; IBS = internal brown spot.

3/ Percent of french fries showing dark ends.

4/ GC = growth cracks; EH = elephant hide skin.

Oregon Table 2. Average Yield and Quality Characteristics of Seven Potato Varieties and Selections Grown on Four Commercial Farms in the Columbia Basin.

Entry	Yield, Cwt/A		Avg. Tub. Wt., Oz.	Spec. Grav.	Percent				Comments
	Total	No. 1			No. 1	No. 2	HH	BC	IBS
R. Burbank	530	308	9.3	1.080	58	19	2.8	1.3	1.0
A69870-3	630	558	10.4	1.081	88	4	3.8	0.3	0.3
AD74135-1	630	424	12.2	1.078	67	17	0.5	0.0	0.0
Lemhi	561	396	10.8	1.082	69	14	7.0	0.0	0.0
Targhee	532	413	9.5	1.082	77	7	2.3	0.3	0.0
Butte	450	293	8.4	1.085	62	11	0.5	1.5	0.0
A74393-1	558	450	10.8	1.081	81	7	23.0	0.0	0.0

1/ Specific gravities determined by the potato hydrometer method.

2/ HH = hollow heart; BC = brown center; IBS = internal brown spot.

Oregon Table 3. Yield and Quality Characteristics of 14 Varieties and Selections at Corvallis, 1982

Entry	Owt/A		Percent		Specific Gravity	Chip ^{2/} Color	Comments ^{3/}
	Mkt.	Total	Mkt.	<4 oz.			
Allagash	254	399	67.2	17.6	1.073	4.0	Dark. Rots. Lenticels.
Atlantic	390	565	69.5	10.4	1.098	4.0	Smooth, Uniform Rnd. Rus. HH!
Bintje	195	437	44.1	31.5	1.085	3.9	Yel. Flesh. Bumpy. Eyes.
Butte	308	495	62.3	29.4	1.093	7.1	Smoothen, flatter than R. Burbank
Lemhi	245	410	55.9	24.5	1.095	4.3	Smooth. Light Eyes.
ND146-4R	269	431	62.2	32.6	1.070	5.3	Small. Red. Good color. Good
ND388-4Rus	260	446	58.4	11.9	1.083	6.1	GC, G. Rough skin. Dark rus.
ND534-1Rus	355	476	74.7	11.5	1.076	7.6	Long, GC, G. Dark rus. Fair
ND678-8	386	576	67.1	14.7	1.083	5.4	G. Yellowish skin. Variable
Norchip	142	321	44.3	18.5	1.085	4.9	G. GC. Rough!
Rosa	314	482	65.5	20.6	1.084	4.3	Pink eyes, white. G.
R. Burbank	266	457	58.0	18.9	1.091	6.3	Good. Typical knobs, etc.
Sangre	294	421	70.1	13.2	1.076	8.8	Red. Deep eyes. G.
WC521-12	341	500	67.8	10.0	1.103	4.9	G. GC. Knobs
LSD, .05	67	101	9.5	6.5	0.005	1.5	Nice. Blocky tan to lt. rus.

1/ MKT = marketable, or US No. 1 & No. 2 potatoes. HH = hollow heart. IN = internal necrosis.

2/ Potato Chip Industry International Color Reference Standard for Potato Chips. 1 = light; 10 = dark.

3/ G = sun green. GC = growth cracks.

IRISH POTATO VARIETY EVALUATION (Spring 1981)(SOUTH CAROLINA)

W. R. Sitterly¹

- Purpose:** To evaluate Irish potato breeding lines for adaptability to coastal South Carolina.
- Procedure:** On February 10, a field of sandy loam was fertilized with 800 lbs/A of granular 10-10-10. Seed pieces of candidate entries were planted, using a randomized block design of four replicates. The seeded area was treated with 1.5 lbs/a of Eptam and then bedded. At emergency, the planted area was dragged off, a side-dressing of 200 lbs/a of granular 5-10-10 and 30 lbs. of nitrogen/a was applied, and the entire area was rebedded. Pesticides were applied as needed.
- Results:** The growing season was cool and dry. The crop was harvested on June 4.
- As shown in Table 1, the highest yields were produced by Atlantic, Hudson, B8091-8, and B6986-2.
- Atlantic, B8599-42, and B6986-2 were the earliest maturing lines.
- The highest DM (dry-matter content) was produced by Atlantic, B9018-12, B7154-10, and B6987-184.
- Atlantic, Hudson, and B7154-10 had the best resistance to internal browning and blossom-end browning. Additionally, B8091-8 and La Chipper browned quickly upon cutting tubers. B9018-12 and B6987-184 appeared to withstand shipping the best. B7154-10, B8599-42, and Atlantic had a type of Russet exterior.
- Conclusions:** The most satisfactory Irish potato variety in this test was Atlantic. Atlantic has a medium-large upright bush with medium-large dark-green leaves. The bush has purplish-white flowers. The tubers are smooth, large, oval-elongate, shallow-eyed, and white. The flesh color is cream.

¹Clemson University Coastal Experiment Station,
Charleston, South Carolina

Irish Potato Variety Table 1. Evaluation of Irish potato lines for adaptability to coastal South Carolina (spring 1981).

Variety	Size	Yield (cwt/a)	Matur- ity	Shape	DM (%)	Internal Browning (%)	Blossom End Browning (%)
B6969-2	Med-lg.	102	M	Oval-elong.	16.2	10	10
B6986-2	Med-lg.	186	E	Oval-elong.	17.5	10	-
B6987-29	Med-lg.	180	M	Oval-elong.	18.8	-	10
B6987-184	Small	70	M	Oval-elong.	19.3	10	-
B7154-10	Med.	150	ML	Oval	19.3	-	-
B7805-1	Large	139	M	Oval-elong.	18.3	20	-
B8091-8	Med.	188	ML	Oval	18.4	-	10
B8599-42	Sm-med.	114	E	Oval-elong.	18.0	10	20
B9018-12	Med.	160	M	Oval-elong.	19.6	-	10
B9127-1	Med-lg.	157	M	Oval-elong.	16.9	10	-
Atlantic	Large	199	E	Oval-elong.	20.1	-	-
La Chipper	Med.	170	M	Oval-elong.	18.1	10	-
Hudson	Large	189	ML	Oval-elong.	17.6	-	-

TEXAS

J. Creighton Miller, Jr. and Douglas G. Smallwood

Variety Development and Testing

Seedling Program. Approximately 24,000 first-year seedlings, representing 190 families, were grown for selection near Hereford in 1982, and 203 original selections were made from this material. Approximately one-fourth (6141) of the 1982 first-year seedlings resulted from crosses made at the Texas Agricultural Experiment Station near Lubbock during the winter of 1980-81. The remainder were obtained from Joe Pavak in Idaho (9671), Bob Johansen in North Dakota (5187) and Florian Lauer in Minnesota (3000). The Texas program also supplied the North Dakota and Idaho programs with second, third and fourth sized seedling tubers for selection.

Adaptation Trials. Some 781 entries were grown in replicated and nonreplicated trials at two locations in West Texas. This provided for testing both on sandy soil with center pivot irrigation (Hart) and on clay or tight soil (Hereford) where the furrow irrigation method is used. Not all entries were included at each locale. Selected trials are included in this report.

The variety and advanced selection trial at Hereford (Table 1) was planted on March 15 and harvested on July 29. The outstanding entries in the Hereford trial were: Red LaSoda, Batouche, A 143.70-2, ND 677-7, ND 258-1 and TX 6-001-8 Ru. Russet selections deserving mention include ATX 9-7738-8 Ru, ATX 9-7738-9 Ru, MnTX 8-57-1 Ru (Colorado seed source), ATX 9-77266-2 Ru and Lemhi Russet (Id). The relative ranking, based on total yield, was as follows: Norgold #10, Norgold #10-7, Norgold #35, Norgold "M", Norgold #19, regular Norgold Russet and Norgold #40.

The variety and advanced selection trial at Hart (Table 2) was grown on relatively sandy soil in contrast to the heavy clay soils in Hereford. Yields at Hart were comparable to those obtained at Hereford. Red entries deserving mention include Red LaSoda, Batouche and NDTX 8-731-1 R. The outstanding russet entries were ATX 9-77259B-8 Ru, Norgold Russet, Norgold #5, ATX 9-7738-9 Ru, Norgold #10, ND 388-1 Ru and MnTX 8-57-1 Ru (Colo).

Advanced selections from various breeding programs were tested under Texas conditions (Tables 2 and 3). Several of these entries performed well relative to the check varieties. Those deserving mention based on overall performance include: ND 971-5 Ru, TX 9-655-20 Ru, TX 9-652-20 Ru, NDTX 9-1069-4 Ru and Nd 1074-2 Ru (Table 3) and ATX 9-77266-20 Ru, TX 9-652-10W, NDTX 9-1069-4 Ru, TX 9-652-20 Ru, NDTX 9-1068-11 R, ATX 9-7738-8 Ru, TX 9-646-6 Ru, NDTX 9-880-1 R, TX 9-581-2 Ru and TX 9-682-8 Ru (Table 3). Entries in Table 3 were selected in Texas, 1979, and grown from Texas seed in 1982.

Texas Table 1. Total yield, percent of tubers over 4 ounces, average weight per tuber in ounces, specific gravity, vigor, maturity and general rating of 48 potato varieties or selections grown at Hereford, Texas-1982.

Variety or Selection	Total Yield CWT/A.	Percent of Tubers Over 4 oz.	Average Weight/ Tuber in oz.	Specific Gravity	Vigor ^{1/}	Maturity ^{2/}	General ^{3/} Rating
Red LaSoda	374.9	74.1	7.4	1.070	4.0	2.7	3.8
Batouche	338.9	77.3	7.5	1.069	4.0	2.7	3.7
Norgold #10	331.3	59.6	6.6	1.074	3.8	2.5	3.0
A 143.70-2	329.9	66.4	5.7	1.078	3.7	3.8	3.6
ND 677-7	324.1	55.7	5.1	1.075	3.5	2.4	3.1
ND 258-1	323.8	54.3	5.1	1.079	3.3	3.4	3.3
TX 6-001-8 Ru	321.5	69.4	6.3	1.069	3.5	3.8	3.7
Norgold #10-7	318.3	57.5	6.3	1.072	3.7	2.5	3.4
Norchip	317.1	69.2	5.8	1.086	3.7	2.6	3.0
Norgold #35	313.1	59.2	5.8	1.071	3.5	2.7	3.0
ATX 9-7738-9 Ru	310.6	78.4	7.5	1.083	3.5	3.3	3.8
MnTX 9-46-2 Ru	306.7	44.1	3.7	1.083	3.5	3.5	2.7
MnTX 9-46-1Ru (TX)	300.0	67.8	6.8	1.084	2.4	3.0	2.8
ATX 9-7738-13 Ru	298.8	71.6	8.1	1.078	4.3	2.3	3.0
ATX 9-71881-2 Ru	289.5	66.7	6.5	1.064	3.3	3.1	3.2
Norgold "M"	286.6	64.4	6.0	1.070	3.8	2.6	3.5
NDTX 8-666-1 Ru	285.8	65.3	5.2	1.082	3.5	3.8	3.0
New Norchip	285.5	59.0	5.2	1.080	3.9	2.3	3.1
MnTX 8-57-1 Ru (Colo)	281.1	55.3	5.2	1.078	3.7	3.4	3.2
ATX 9-77259B-8 Ru	278.2	58.8	4.4	1.078	3.3	3.3	3.3
MnTX 9-46-1 Ru (Colo)	277.3	57.9	4.9	1.087	3.8	3.4	3.3
ATX 9-77266-2 Ru	277.0	64.8	5.8	1.089	3.3	2.3	3.4
Norgold #19	272.7	57.4	6.4	1.067	4.0	2.3	3.5
ATX 9-7738-8 Ru	270.5	61.8	6.2	1.079	3.5	3.3	3.5
MnTX 9-86-1 Ru	268.0	69.8	6.5	1.083	3.9	3.2	3.2
ND 388-1 Ru	268.0	51.4	5.0	1.080	3.3	3.9	3.3
WC 521-12	262.5	76.1	6.9	1.092	4.9	2.4	3.2
NDD 143-1	251.2	59.2	4.7	1.072	3.4	2.3	2.7

Continued

Texas Table 1. Continued

Variety or Selection	Total Yield CWT/A.	Percent of Tubers Over 4 oz.	Average Weight/ Tuber in oz.	Specific Gravity	Vigor ^{1/}	Maturity ^{2/}	General ^{3/} Rating
Lemhi Russet (ID)	250.9	76.3	6.5	1.084	4.0	2.2	3.7
ND 651-9	248.6	26.4	3.6	1.079	2.6	3.7	2.5
NDTX 8-731-1 R	247.9	63.1	5.2	1.071	2.9	4.0	2.9
ND 463-1 R	238.7	58.4	5.3	1.076	2.9	4.0	2.9
Allagash Russet	237.8	68.4	5.8	1.075	2.9	3.7	2.9
Norgold Russet	233.5	72.6	6.0	1.074	3.0	3.0	3.5
A 72685-2	233.2	61.8	5.5	1.084	4.3	1.9	3.0
Lemhi Russet (Neb)	232.9	67.7	6.1	1.082	4.4	2.6	3.5
ATX 6-74198-1 Ru	230.0	50.3	4.3	1.075	2.8	3.7	2.8
MnTX 8-57-1 Ru (ND)	229.7	37.4	4.6	1.066	2.4	4.5	2.3
MnTX 8-57-1 Ru (Mn)	209.7	62.7	5.2	1.077	3.2	3.5	3.2
AS 433-2	201.7	64.7	7.0	1.076	3.3	3.8	3.0
Norgold #40	187.3	65.7	6.5	1.073	4.3	1.9	3.4
CS 73105-2 Ru	176.9	61.6	4.4	1.081	3.0	4.5	2.8
CS 76111-14	172.5	69.0	5.5	1.068	2.5	4.0	2.8
A 74133-1	167.9	74.2	6.3	1.072	4.4	1.9	3.0
NDTX 5-15-1 Ru	160.3	30.6	3.4	1.084	2.9	3.2	2.8
AD 7377-1	150.1	63.2	6.2	1.063	4.0	2.2	2.5
CS 77118-4 R	137.6	57.1	6.0	1.079	2.8	4.0	3.0
CS 78144-4 Ru	133.6	47.6	4.4	1.071	1.9	3.0	2.5
Average	263.5	61.2	5.7	1.077	3.5	3.1	3.1
L.S.D. (.05)	51.0	12.2	0.9				

^{1/} 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

^{2/} 1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early

^{3/} 1 = very poor to 5 = excellent

Texas Table 2. Total yield, percent of tubers over 4 ounces, average weight per tuber in ounces, specific gravity, type, vigor and general rating of 48 potato varieties or selections grown at Hart, Texas - 1982.

Variety or Selection	Total Yield CWT/A.	Percent of Tubers Over 4 oz.	Average Weight/ Tuber in oz.	Specific Gravity	Type ^{1/}	Vigor ^{2/}	General ^{3/} Rating
ATX9-77259B-8 Ru	367.6	81.3	6.0	1.070	2.8	3.4	3.4
Norchip	365.9	52.9	4.8	1.070	1.9	3.7	3.2
ND 258-1	349.6	47.4	4.8	1.076	1.9	3.8	3.5
ND 677-7	345.0	45.9	4.4	1.073	1.7	3.8	3.2
Norgold Russet	344.4	49.3	4.9	1.063	2.7	3.2	3.5
Red LaSoda	339.8	64.7	6.1	1.061	2.0	3.7	3.3
Norgold #35	337.2	42.8	4.6	1.064	2.7	3.7	3.3
Batouche	318.0	55.2	4.8	1.066	2.0	3.9	3.2
NDTX 8-731-1 R	308.4	59.5	4.5	1.059	1.9	3.0	3.5
New Norchip	307.5	35.0	3.5	1.073	1.7	4.7	2.8
ATX 9-7738-9 Ru	302.3	50.6	5.3	1.072	2.7	3.5	3.3
MnTX 9-46-1 Ru (TX)	297.7	70.6	6.3	1.077	1.9	3.7	3.0
Norgold #10	296.2	40.3	4.6	1.064	1.9	3.5	3.5
ND 651-9	290.4	24.7	3.2	1.075	2.7	3.4	2.5
Norgold "M"	283.7	52.8	4.8	1.067	2.7	3.8	3.2
Norgold #10-7	283.7	51.6	5.6	1.062	2.0	3.8	3.3
ND 388-1 Ru	282.0	56.9	5.2	1.070	2.5	3.8	3.7
MnTX 8-57-1 Ru (Colo)	280.5	51.5	4.5	1.065	2.2	3.8	3.4
MnTX 9-46-2 Ru	277.3	25.6	3.0	1.069	2.4	3.8	2.9
A 143.70-2	273.8	36.0	4.0	1.068	2.5	3.5	3.0
TX 6-001-8 Ru	264.3	60.6	5.7	1.059	2.2	3.1	3.0
ATX 9-77266-2 Ru	261.4	51.7	5.1	1.081	2.2	3.9	3.5
ATX 9-7738-8 Ru	254.8	63.5	5.3	1.067	2.8	3.9	3.5
ATX 9-7738-13 Ru	250.0	43.4	4.3	1.083	2.3	4.3	3.0
MnTX 8-57-1 Ru (Mn)	249.5	48.4	4.3	1.070	1.8	4.0	3.5
MnTX 9-46-1 Ru (Colo)	247.7	58.0	4.9	1.082	2.1	3.8	3.0

Continued

Texas Table 2. Continued

Variety or Selection	Total Yield CWT/A.	Percent of Tubers Over 4 oz.	Average Weight/ Tuber in oz.	Specific Gravity	Type ^{1/}	Vigor ^{2/}	General ^{3/} Rating
NDTX 8-666-1 Ru	246.1	38.1	4.2	1.073	2.3	3.4	3.0
Norgold #40	245.1	44.8	4.5	1.066	1.8	4.6	3.3
Allagash Russet	233.5	55.6	5.6	1.066	3.0	3.2	3.3
MnTX 9-86-1 Ru	229.7	48.9	5.0	1.071	1.9	3.6	3.1
NDTX 5-15-1 Ru	229.4	37.1	3.9	1.076	1.2	4.6	3.3
CS76111-14	226.5	69.6	6.0	1.067	2.8	3.0	2.8
WC 521-12	225.1	48.4	4.8	1.092	1.2	4.6	2.9
ATX 9-71881-2 Ru	220.7	62.2	4.7	1.062	3.2	3.2	3.5
NDD 143-1	218.1	36.8	4.1	1.071	1.8	3.0	2.9
Norgold #19	212.3	42.5	4.8	1.067	2.0	3.9	3.2
Lemhi Russet (ID)	211.4	36.5	3.9	1.074	1.5	4.3	3.3
ATX 6-74198-1 Ru	207.6	56.9	4.6	1.065	2.5	3.3	3.5
AS 433-2	207.3	76.1	8.3	1.066	2.9	3.2	3.3
CS 73105-2	205.6	47.8	4.1	1.064	3.0	3.0	3.8
A 72685-2	203.0	28.6	3.6	1.074	1.2	4.8	3.2
Lemhi Russet (Neb)	196.6	38.8	4.2	1.072	1.8	4.3	3.3
MnTX 8-57-1 Ru (ND)	195.1	38.8	4.1	1.071	1.7	2.9	2.8
AD 7377-1	194.6	35.4	4.1	1.059	2.4	4.2	3.3
A 74133-1	181.8	21.1	3.2	1.071	1.7	4.0	2.6
ND 463-1 R	148.4	44.1	5.0	1.063	3.0	3.2	3.0
CS 78144-4 Ru	137.9	61.7	4.8	1.071	2.6	3.0	2.9
CS 77118-4 R	128.1	66.7	6.0	1.058	1.0	2.8	2.0
Average	258.1	47.4	4.6	1.069	2.2	3.8	3.2
L.S.D. (.05)	56.2	12.5	0.8				

^{1/} 1 = upright, 2 = semiprostrate, 3 = spreading

^{2/} 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

^{3/} 1 = very poor to 5 = excellent

Texas Table 3. Total yield, grade distribution by number, average weight per tuber in ounces, vigor, maturity and general rating of 30 North Dakota, Texas, Idaho-North Dakota and North Dakota-Texas advanced selection and 2 check varieties of potatoes grown at Hereford, Texas - 1982.

Selection or Check Variety	Total Yield CWT/A	Percent Tubers by Number		Average Weight/ Tuber in oz.	Vigor <u>1/</u>	Maturity <u>2/</u>	General <u>3/</u> Rating
		Under 2 in.	Over 2 in.				
Red LaSoda	583.7	30.0	69.9	8.1	3.9	2.7	3.0
ND 971-5 Ru	512.3	48.8	51.2	7.1	3.7	2.9	2.9
TX 9-655-20 Ru	505.3	48.2	51.8	5.9	3.5	3.3	3.0
TX 9-652-20 Ru	446.1	36.2	63.8	6.6	3.3	3.0	3.0
ND 722-2 Ru	442.6	84.1	15.9	3.4	3.3	2.8	2.5
AND 7430-1 Ru	414.7	59.1	40.9	5.2	3.5	3.3	2.9
NDTX 9-1069-4 Ru	393.8	67.7	32.3	5.1	3.3	3.0	3.0
ND 657-3 Ru	386.8	73.5	26.5	5.2	2.4	3.3	2.7
ND 689-3	383.3	55.6	44.4	5.6	3.7	3.3	2.7
ND 1065-12	381.6	75.4	24.6	3.5	3.0	3.0	2.7
TX 9-649-9 Ru	365.9	26.6	73.4	7.4	3.0	2.5	2.8
ND 799-2 Ru	364.2	76.2	23.8	3.7	3.0	3.0	2.7
ND 899-6 R	358.9	62.4	37.6	4.1	3.7	2.4	2.7
ND 967-1 Ru	357.2	62.5	37.5	4.4	3.0	3.0	2.8
ND 670-9 Ru	339.8	70.7	29.3	4.6	2.9	3.3	2.4
Norgold Russet	338.0	38.9	61.1	6.6	2.8	3.5	3.3
NDTX 9-1068-11 R	327.6	34.8	62.3	6.1	2.8	3.3	3.0
ND 812-9 Ru	311.9	84.0	16.0	3.5	3.0	3.5	2.7
ND 944-6	308.4	52.8	47.2	5.0	3.0	2.0	2.5
ND 698-1	303.2	45.8	54.2	4.6	2.9	3.8	2.4
ND 843-5 Ru	298.0	54.9	45.1	5.5	2.7	3.3	3.0
ND 748-3 Ru	277.0	65.5	34.5	6.4	2.8	3.5	2.8
ND 1074-2 Ru	275.3	65.6	34.4	5.1	3.0	3.8	3.3
TX 9-657-39 Ru	264.8	34.1	65.9	8.0	2.9	3.0	3.0
ND 770-4 Ru	242.2	51.2	48.8	6.3	3.0	3.5	2.8
ND 799-2 Ru	210.8	76.5	23.5	4.1	1.8	4.3	2.5
ND 671-3 Ru	209.1	74.9	25.1	4.8	2.3	4.0	2.7
ND 966-5 Ru	196.9	70.3	29.7	4.1	2.9	2.3	2.8
NDTX 9-851-1 R	191.7	0	100.0	8.8	2.8	3.0	3.0
ND 534-8 Ru	189.9	50.5	49.5	6.1	1.8	4.0	2.7

Continued

Texas Table 3. Continued

Selection or Check Variety	Total Yield CWT/A	Percent Tubers		Average Weight/ Tuber in oz.	Vigor <u>1/</u>	Maturity <u>2/</u>	General <u>3/</u> Rating
		Under 2 in.	by Number Over 2 in.				
TX 9-682-10 Ru	174.2	66.7	33.3	4.1	2.8	2.9	3.0
NDTX 8-349-4 R	156.8	30.0	70.0	7.2	3.0	3.0	2.5
Average	333.5	56.7	43.3	5.4	3.0	3.2	2.8
L.S.D. (.05)	112.2	14.5	14.5	1.6			

1/ 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

2/ 1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early

3/ 1 = very poor to 5 = excellent

Texas Table 4. Total yield, grade distribution by number, average weight per tuber in ounces, vigor, maturity and general rating of 55 Idaho-Texas, North Dakota-Texas and Texas advanced selections (Texas seed) and 2 check varieties of potatoes grown at Hereford, Texas - 1982.

Selection or Check Variety	Total Yield CWT/A	Percent Tubers by Number		Average Weight/ Tuber in oz.	Vigor ₁	Maturity ₂	General ₃ Rating
		Under 2 in.	Over 2 in.				
Red LaSoda	441.4	24.9	75.1	8.6	3.9	2.6	3.8
ATX 9-77266-2 Ru	367.6	48.8	51.2	5.3	3.5	2.8	3.3
TX 9-655-20 Ru	366.5	25.3	74.7	7.0	3.3	3.5	3.0
TX 9-652-10 W	360.1	29.4	70.6	8.1	3.7	3.0	3.2
NDTX 9-1069-4 Ru	352.5	62.0	38.0	4.6	3.5	3.0	3.5
TX 9-652-20 Ru	329.3	34.0	66.0	6.0	3.2	3.3	3.0
NDTX 9-1068-11 R	325.0	42.7	57.3	6.4	3.0	3.3	3.5
TX 9-646-4 Ru	299.1	33.1	66.9	5.8	3.0	3.5	3.1
ATX 9-7738-8 Ru	298.0	51.4	48.6	5.5	3.2	3.3	3.6
TX 9-657-49 Ru	296.2	53.7	46.3	5.5	2.9	3.1	2.9
TX 9-649-9 Ru	293.3	35.8	64.2	8.6	3.5	3.6	3.2
TX 9-646-6 Ru	290.0	17.0	83.0	9.8	3.9	2.3	3.3
TX 9-684-1 Ru	285.2	43.8	56.2	6.1	3.8	3.2	2.9
NDTX 9-880-1 R	282.3	39.9	60.1	5.8	3.5	3.5	3.3
TX 9-655-23 Ru	264.8	55.0	45.0	4.9	2.9	3.5	2.8
ATX 9-77236-8 Ru	264.8	86.2	13.8	2.7	3.0	3.7	2.6
Norgold Russet	264.8	47.8	52.2	5.2	3.0	3.5	3.2
ATX 9-77254-16 Ru	261.9	62.9	37.1	4.1	3.8	2.3	2.8
TX 9-581-2 Ru	257.9	24.4	72.6	7.6	3.9	2.5	3.3
ATX 9-77262-2 Ru	254.4	71.8	28.2	4.0	3.3	2.9	2.7
ATX 9-75446-2 Ru	252.6	82.2	17.8	3.5	2.8	2.6	2.8
TX 9-682-8 Ru	249.2	33.3	66.7	8.5	4.0	1.6	3.4
ATX 9-7738-9 Ru	248.0	55.8	44.2	6.1	3.2	3.1	3.2
ATX 9-77254-4 Ru	246.8	59.2	40.8	4.5	3.2	3.0	2.9
NDTX 9-993-5 W	246.3	50.0	50.0	4.9	3.3	3.2	2.9
ATX 9-77199-1 W	245.7	40.0	60.0	5.7	3.3	3.5	3.0

Continued

Texas Table 4. Continued

Selection or Check Variety	Total Yield CWT/A	Percent Tubers by Number		Average Weight/ Tuber in oz.	Vigor ^{1/}	Maturity ^{2/}	General ^{3/} Rating
		Under 2 in.	Over 2 in.				
ATX 9-77255-7 Ru	242.2	56.1	43.9	4.9	3.3	3.3	2.9
ATX 9-77259B-8 Ru	238.7	58.2	41.8	4.1	2.9	3.2	3.0
NDTX 9-867-1 Ru	236.4	40.6	59.4	5.8	3.0	3.8	3.2
ATX 9-7738-13 Ru	235.2	40.1	59.9	7.4	3.9	2.7	3.0
TX 9-682-20 Ru	234.1	55.1	44.9	4.3	3.0	3.5	2.9
ATX 9-77259B-5 Ru	232.9	74.0	26.0	3.5	2.9	3.3	3.0
NDTX 9-1015-1 Ru	228.8	64.4	35.6	4.3	2.7	3.5	3.0
ATX 9-77259B-7 Ru	227.1	78.8	21.2	3.5	3.3	2.8	2.7
TX 9-655-10 Ru	222.4	38.3	61.7	6.8	2.5	3.5	2.7
NDTX 9-820-1 R	221.3	54.0	46.0	4.7	2.7	3.3	2.7
TX 9-656-2 Ru	216.1	57.9	42.1	5.1	3.5	3.1	2.3
TX 9-677-1B Ru	215.5	61.9	38.1	4.7	2.9	3.2	2.6
ATX 9-77721-1 Ru	213.2	50.6	49.4	4.8	3.3	3.1	2.8
ATX 9-75446-4 Ru	211.4	64.8	35.2	3.7	2.8	3.5	2.9
ATX 9-77236-9 Ru	210.8	61.5	38.5	7.4	3.0	3.5	2.5
TX 9-683-5 Ru	210.2	41.4	58.6	5.4	3.2	4.2	2.9
ATX 9-77254-5 Ru	206.8	55.4	44.6	4.0	4.2	1.9	2.8
TX 9-649-20 Ru	205.0	56.9	43.1	4.8	2.9	3.5	2.9
ATX 9-75446-8 Ru	202.1	49.6	50.4	4.8	2.9	3.2	2.9
ATX 9-77236-3 Ru	200.4	82.5	17.5	4.4	3.5	3.7	2.6
TX 9-657-39 Ru	195.7	59.0	41.0	4.6	2.3	3.2	2.8
ATX 9-75446-9	195.7	46.7	53.3	8.5	3.0	3.3	3.1
TX 9-657-36 W	185.3	41.7	58.3	6.0	3.0	3.3	3.0
ATX 9-75446-1 Ru	178.3	71.8	28.2	3.7	3.2	3.0	2.8
ATX 9-77254-3 Ru	177.7	53.8	46.2	3.2	4.0	2.0	2.7
ATX 9-77529-5 Ru	167.3	58.6	41.1	4.3	2.9	4.3	3.0
ATX 9-7152-2 Ru	166.7	57.6	42.4	5.9	3.6	2.0	2.9
TX 9-685-1 Ru	159.7	36.3	63.7	8.6	2.9	2.9	2.9
TX 9-652-8 Ru	143.5	55.3	44.7	5.1	2.2	3.3	2.8
NDTX 9-1012-1 Ru	141.1	55.3	44.7	6.5	2.4	3.2	3.0
ATX 9-77574-1 Ru	132.4	81.8	18.9	2.8	2.8	3.5	2.8
Average	245.9	51.7	48.3	5.5	3.2	3.1	3.0
L.S.D. (.05)	81.6	21.6	21.6	2.5			

1/ 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

2/ 1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early

3/ 1 = very poor to 5 = excellent

VIRGINIA

S. B. Sterrett, C. P. Savage, Jr., and M. P. Mascianica
Virginia Truck and Ornamentals Research Station, Painter

Purpose	Our primary objective is to evaluate material for improved yield, early sizing, internal and external tuber quality, disease resistance, and processing potential. The screening of russet varieties for adaptation to this growing area and the evaluation of named and experimental varieties under varied management systems are also under study.
Justification	The potato industry on the Eastern Shore of Virginia includes both chipping potatoes and table stock, with the proportion dependent to some extent on market conditions and demand. Therefore, varieties which can be used for this dual purpose and are adapted to this area are requisite. The increase in the acreage of potatoes grown under irrigation dictates that yield potential and quality under irrigated and dry-land conditions be evaluated.
Plot Procedures and Growing Conditions	<p><u>Variety Evaluation.</u> The observational trial consisted of 20 ft single row plots (12" spacing within row) without replication; advanced trials included 25 ft single row plots with four replications. Because of above-average rainfall in March, planting was delayed to April 1.</p> <p>Plots received a band-placement of 1100 lbs 10-10-10/A at planting. All plots were sidedressed with 50 lb NH_4NO_3-N/A on May 27. Foliar sprays containing B, Cu, Mn, and Zn were applied to all plots on May 28 and June 11. Aldicarb was banded in the seed furrow at 3 lb/A. Metribuzin (0.5 lb/A) was applied at drag-off (April 23). Carbofuran (0.5 lb/A) + Oxamyl (0.25 lb/A) were applied four times during the season for control of Colorado potato beetles. All plots were hand harvested on July 13 and graded on a chain type grader that retained tubers $\geq 1\text{-}7/8$ inches in diameter.</p>
Irrigation Study	A long-term site was established in 1981. Two levels of irrigation (- or +) were evaluated in 1981 and 1982. The experimental design was a split-plot, where irrigation level comprised the unreplicated whole plot and variety (4 replicates) comprised the subplots. Irrigation plots are reversed annually to allow for statistical analysis of the influence of irrigation. Experimental conditions were similar to those described under Virginia (National Potato Breeding Report, 1981. USDA-ARS-BARC) and above for 1981 and 1982, respectively. Notable differences included 1981 and 1982 planting dates (March 11 and March 30) and harvest dates (June 26 and July 21). Irrigation was scheduled according to a computerized water-balance model and totaled 5.4 and 5.5" for 1981 and 1982.
Results	<p><u>Observation Trials.</u> A total of 55 round white and 45 russet selections were evaluated for vine attractiveness, size, and defoliation, as well as tuber shape, size, net (russets), skinning maturity, conformation, and color.</p>

Advanced Round White Trial. The yield of several numbered lines--B9127-6, B9340-13, B8710-16, B8710-1, B9423-4, B9140-32, and B9335-3, as well as Norchip and Belchip was greater than that of Superior (Table 1). The highest specific gravity was found in Atlantic followed by B9335-35 and Chipbelle. Chipbelle, B9335-35, B9335-7, B8799-13, and B9423-4 exhibited phytotoxic symptoms caused by metribuzin on more than 20% of the total leaf area. The severe metribuzin injury found on Chipbelle (51%) and B9335-35 (45%) would account in part for the reduced yield. Chipbelle and B9335-35 also had a larger percentage (approximately 20%) of undersized tubers.

Advanced Russet Trial. Greater yield was observed for B8686-8, B9164-1, and B7583-6 than Norgold Russet or Belrus. The specific gravity of B8686-8, B9164-1, and B7583-6 was greater than that of Russet Burbank or Belrus. Substantial metribuzin related phytotoxicity (> 20% of total leaf area) was evident on B8833-6 and B9539-7.

In general, both total yield and US #1 A grade was higher in round whites than russets in our trial. In addition, the percentage of unacceptably small (< 1-7/8") potatoes was greater in the russet trial. Although the potatoes were planted three weeks later in 1982 than 1981, the incidence of heat necrosis was considerably less in the 1982 growing season.

Irrigation Study. In general, yields were enhanced with irrigation in 1981 and 1982. Norgold Russet appeared to be relatively unresponsive to irrigation, while Atlantic, Belrus, and Superior were quite responsive to irrigation. Lower specific gravities accompanied yield responses to irrigation. This trend was consistent across cultivar and year. In 1982, Atlantic demonstrated significant (> 40% leaf surface affected) metribuzin injury and internal necrosis (43%), regardless of irrigation treatment (data not shown).

Acknowledgement:

The assistance of J. Watts, Berwick, Pennsylvania, in chip color evaluation was greatly appreciated.

Virginia Table 1. Characteristics of entries in advanced round white trial - 1982

Pedigree	Yield, cwt/A US#1	Total	Spec. Gravity	Hollow ^{2/} Heart (%)	Heat ^{2/} Nec. (%)	Tuber ^{3/} Shape	Vine ^{4/} Mat.	Metribuzin ^{5/} Injury (%)	Chip ^{6/} Color
B 9127-6	375 a ^{1/}	404	1.0689	35	0	4	7	2.0 g	3.3
B 9340-13	362 ab	392	1.0751	5	0	4	3	3.0 g	2.5
B 8710-16	352 a-c	396	1.0802	10	0	1	8	6.0 e-g	5.5*
B 8710-1	349 a-d	381	1.0676	5	0	3	3	9.6 d-g	4.3*
B 9423-4	341 a-e	386	1.0751	0	0	3	6	20.0 c	3.0
Norchip	318 b-f	358	1.0812	10	5	3	5	4.3 g	3.0
B 9140-32	317 b-f	346	1.0826	5	0	2	5	3.8 g	2.5
Belchip	313 b-f	340	1.0821	15	0	3	8	6.3 e-g	3.0
B 9335-3	312 b-f	347	1.0835	45	0	3	7	13.0 c-f	3.0
Superior	309 c-g	338	1.0797	5	0	3	3	8.0 d-g	4.0
B 9311-7	308 c-h	339	1.0818	5	0	3	6	8.5 d-g	2.3
B 8724-2	308 c-h	354	1.0807	0	0	3	4	6.0 e-g	3.3
B 8091-8	303 c-h	340	1.0842	0	0	9	9	2.8 g	3.5*
Oceana	300 d-i	331	1.0688	5	0	2	4	2.3 g	5.3*
B 9335-7	299 d-j	320	1.0780	0	0	3	7	35.0 b	4.3
LaChipper	297 e-j	331	1.0729	15	5	3	4	4.8 fg	4.8*
B 9224-6	293 e-j	331	1.0768	0	0	3	6	15.0 cd	3.8
B 8706-7	283 f-j	312	1.0735	20	0	2	9	18.3 c	4.3
Atlantic	271 f-k	304	1.0967	0	5	2	8	13.8 ce	2.8
Pungo	260 g-k	292	1.0842	5	0	2	7	3.0 g	4.8*
B 8799-13	257 h-k	281	1.0841	40	0	1	5	32.5 b	3.0
B 9140-14	251 i-k	304	1.0859	10	0	2	5	30.0 b	2.8
Crystal	249 j-k	292	1.0773	0	0	2	7	2.3 g	5.8*
B 9335-35	234 k	290	1.0906	0	0	2	8	45.0 a	2.3
Chipbelle	151 l	188	1.0892	5	0	3	9	51.3 a	3.5

^{1/} Mean separation (in columns) by Duncan's New Multiple Range Procedure, 5% level.^{2/} Evaluation of 20 randomly selected tubers.^{3/} 1=round (spherical); 2=most round; 3=round to oblong; 4=most oblong; 5=oblong to slightly long; 7=oblong to long; 8=most long; 9=long (cylindrical).^{4/} 1=very early; 3=early; 5=medium; 7=late; 9=very late; 2, 4, 6, and 8=intermediate stages.^{5/} Percent of total leaf canopy affected. Larger values denote increased leaf area affected and increased severity of chlorosis.^{6/} 1-4=acceptable; 5=marginal; 6-9=unacceptably dark. * denotes entries with one or more rating ≥ 6 for chips made 3 days, 1 week, 2 weeks, or 3 weeks after harvest.

Virginia Table 2. Characteristics of entries in advanced Russet trial.

Pedigree	Yield, cwt/A		Spec. Gravity	Hollow ^{2/} Heart (%)	Heat ^{2/} Nec. (%)	Tuber ^{3/} Shape	Vine ^{4/} Mat.	Metribuzin Injury ^{5/} (%)
	US#1	Total						
B 9219-2	297 a	345	1.0690	0	5	8	7	8.0 cd
B 8972-1	284 ab	329	1.0768	40	0	8	4	1.5 de
B 9137-9	270 a-c	317	1.0695	0	0	8	5	16.3 b
B 9395-25	253 b-d	292	1.0802	20	0	6	5	2.3 de
B 8833-6	234 c-e	280	1.0712	0	0	8	4	30.0 a
B 9419-6	233 c-e	291	1.0739	0	0	7	4	1.0 e
Norgold Russet	229 c-f	288	1.0702	0	5	4	4	0.0 e
Belrus	227 d-f	278	1.0864	10	20	8	5	1.0 e
Centennial	223 d-g	268	1.0827	15	5	3	4	9.3 c
B 8943-4	220 d-g	251	1.0718	20	0	7	6	3.0 de
B 9164-1	217 d-g	256	1.0945	20	0	8	8	1.5 de
B 8934-4	216 d-g	246	1.0815	20	0	3	4	2.0 de
B 9539-7	212 d-g	289	1.0712	5	5	8	7	28.8 a
B 7583-6	194 e-g	237	1.0882	0	0	5	8	0.0 e
B 8686-8	186 fg	237	1.0953	15	0	6	6	0.0 e
Russet Burbank	179 g	257	1.0884	0	0	6	9	0.5 e

1/ - 5/ See appropriate foot notes in Virginia Table 1.

Table 3. Potato yields and specific gravity as influenced by irrigation -
Painter, Virginia, 1981-1982

Cultivar	Year and Irrigation					
	1981		1982		2 Yr. Avg.	
	No	Yes	No	Yes	No	Yes
	Yield, cwt/A					
Atlantic	181	247	243	364	212	306
Belchip	174	219	---	---	---	---
Belrus	64	108	195	275	130	192
LaChipper	133	188	---	---	---	---
Norgold Russet	118	101	241	284	180	193
Pungo	210	265	---	---	---	---
Superior	153	224	264	418	209	321
B 8833-6 ^{1/}	---	---	89	98	---	---
B 8934-4	---	---	186	306	---	---
B 8943-4 ^{1/}	87	171	187	198	137	185
B 8972-1 ^{1/} (Goldrus)	---	---	204	249	---	---
\bar{X}	140	190	102	274	174	239

	Specific Gravity (1.0 deleted)					
Atlantic ^{2/}	856	791	933	838	823	814
Belchip	723	632	---	---	---	---
Belrus	---	---	864	745	---	---
LaChipper	794	676	---	---	---	---
Norgold Russet	---	---	711	590	---	---
Pungo	727	650	---	---	---	---
Superior	737	637	798	666	768	652
B 8833-6	---	---	810	583	---	---
B 8934-4	---	---	783	680	---	---
B 8943-4	---	---	819	621	---	---
B 8972-1 ^{2/} (Goldrus)	---	---	833	597	---	---
\bar{X}	767	677	828	674	796	733

^{1/} Considerable seedpiece decay and/or soft rot problems in 1982.

^{2/} Considerable hollow heart in 1982.

WASHINGTON

M.W. Martin, P.E. Thomas, G.S. Santo and J.J. Pavsek

Developing and
Evaluating Disease,
Pest and Stress
Resistant Potato
Germplasm

The potato breeding program at Prosser, Washington, has been redirected and combined with the breeding program at Aberdeen, Idaho, and the selection and evaluation programs in other western states to form one comprehensive, regional breeding program. The Prosser portion of this program will concentrate on development and evaluation of disease, pest and stress resistant potato germplasm. This report singles out lines which have shown resistance to four of the worst diseases and pests which trouble the potato industry in the West.

Resistance to
Verticillium wilt
and other early
dying diseases

In 1982 we evaluated 334 varieties and advanced breeding lines in a disease nursery which provided severe exposure to Verticillium wilt. These lines were primarily from the U.S.D.A. Northwest breeding program centered at Aberdeen, Idaho and Prosser, Washington. Also included in this trial were numerous lines from other breeding programs in the U.S. and Canada. For the most part all lines tested had survived selection pressures for other disease resistance or horticultural characteristics or had previously shown Verticillium resistance.

Where sufficient seed was available, each line was planted in three replications of eight hills each in a field which has grown potatoes continuously for over 20 years. During planting the plots were fertilized with only 150 lbs N/a in the form of a 30:10:10:1 NPKZn mix. This low nitrogen fertilizer rate caused a nutrient stress later in the season, which accentuated Verticillium wilt and early blight symptoms. The field was furrow irrigated, according to need, until August, when it was subjected to a 2-week period without irrigation. This caused a water stress which further accentuated Verticillium wilt. The year 1982 was not very conducive to Verticillium wilt in commercial fields, but by mid-September in this disease nursery susceptible and resistant lines, in terms of wilt symptoms, were very obvious.

Many of these same lines were grown in other trials and disease nurseries in 1982, where Verticillium and Sclerotinia wilt early blight, and powdery mildew were often evident, so additional information on the response to these early-dying diseases was thus obtained. In addition, many of these lines have been evaluated in Verticillium and other nurseries in previous

years, so extensive data has been collected regarding the response of some of these lines to early-dying diseases. Listed in Table 1 are lines which we consider having enough Verticillium (early dying) resistance to be useful under severe exposures usually encountered in the Northwest.

Resistance, as measured by symptom expression, was rated on a 1 to 5 scale with 1 being very susceptible and 5 very resistant. On this scale a high average rating of 4.5 to 5.0 was considered undesirable because it is usually associated with late maturity, poor storability and, often, with growth abnormalities and low yield and solids. An effort is being made to develop or find Verticillium resistance in combination with determinant growth habit, to reduce the apparent competition between vines and tubers in highly resistant genotypes.

Resistance to
Columbia Root-Knot
Nematodes

In 1981 and 1982 we screened 465 varieties and advanced breeding lines in a nursery heavily infested with Columbia root-knot nematodes. The field had been covered with several tons of infested Russet Burbank tubers in the fall of 1981, to supplement a natural infestation which had been accumulating during previous trials. Because of a mild winter, many volunteer potato plants resulted. We controlled these early in the season by cultivation and hoeing, but eventually gave up and let them grow. In lines which had moderate to high levels of nematode resistance (Table 2) this provided a dramatic contrast at harvest. Smooth, nematode-free tubers of resistant test lines were mixed with heavily-infested, severely-galled, worthless tubers from the volunteer Russet Burbank plants in the same plots.

Ten representative tubers from each of three replications of each line were saved, stored, and then peeled, thinly sliced and examined for the off-color specks characteristic of internal nematode damage. The internal damage was closely related to external galls. The results reported in Table 2 are based on external symptoms. Because of erratic results often obtained in field studies on root-knot nematode, we assume some lines in this list will be found to be susceptible on further testing. Therefore, these results should be considered tentative, especially where we only had enough seed to plant one replication or only a few tubers were available for examination. However, some lines have now expressed resistance in several replications over a two or three year period of severe exposure. We are gaining confidence that genetic resistance is available that could be very important for commercial growers troubled by this pest on the very susceptible Russet Burbank variety.

Resistance to PVY

In 1981 we decided to quit fighting a severe PVY contamination problem which has plagued breeding work at Prosser for a number of years and turn our efforts to finding resistance to this virus disease, which is destructive worldwide and is a limiting factor in most U.S. breeding programs. During the past 2 years we have screened through 559 varieties and advanced breeding lines in PVY nurseries. Most of these lines were from the Northwest breeding program at Aberdeen and Prosser, but we also included numerous lines from other breeding programs in the U.S. and Canada and throughout the world, some of which were reputed to have PVY resistance. In 1981 young leaves on each plant were rub-inoculated with a buffered PVY inoculum shortly after field emergence. The inoculum was kept in an ice chest until immediately before use. No insecticides were applied and the plants became heavily infested with green peach aphids by mid-summer. While doing late-season tractor cultivation and walking through the plots to take notes or hoe weeds, much intentional rubbing against the plants was done in hopes of further spreading PVY. In 1982, inoculum was mixed with carborundum and pressure sprayed on young leaves of newly-emerged plants. Again aphids and rubbing were encouraged to spread PVY.

In both years, later in the season before senescence or early dying had occurred, each plant was visually rated for current season symptoms of PVY infection and then indexed, using both PVY index host plants and the ELISA technique. At harvest eight tubers were saved from each of three replications of each line and a single seedpiece taken from each tuber to plant back the next year, to be observed for chronic PVY symptoms. Table 3 lists those lines which appear to have worthwhile PVY resistance. Again we expect some susceptible escapes to be identified on further testing, so these results should be viewed as tentative. However, we are gaining confidence that valuable resistance is available in commercial type lines that should be useful breeding parents.

Resistance to PLRV

When we assumed responsibility for the potato germplasm development program seven years ago, we recognized the advantages of Prosser as a location for a breeding program for PLRV resistance, because of the long season and consistently-heavy infestations of green peach aphids. We started immediately screening for PLRV resistance and have tested many hundreds of varieties and advanced breeding lines in severe PLRV disease nurseries since that time.

Each line is planted in three replications of four plants in a field where every third row is planted

with tubers known to be chronically infected with PLRV. No insecticides are used so heavy populations of green peach aphids are present by mid-summer. Current season symptoms appear on most lines but some remain healthy under this severe exposure. Ten tubers are saved from each replication of each promising line and examined for net necrosis after several months of storage. A seedpiece is cut from each tuber and these ten seedpieces are planted the next year to observe for chronic symptoms. Lines that show no current season or chronic symptoms are indexed with the ELISA technique to determine if there are symptomless carriers of PLRV.

We confirmed what others have found, that S. chaocense has high levels of PLRV resistance, bordering on immunity. Our efforts to find worthwhile resistance in S. tuberosum lines near commercial type have resulted in the list shown in Table 4. Again, some of these lines have been tested only one year so these results should be considered tentative. There are big differences in the susceptibility of lines. Some appear to have enough resistance to be commercially valuable. We are endeavoring to increase this resistance by mass-intercrossing these resistant lines and mass screening for resistance in the seedling and subsequent generations.

Washington Table 1. List of lines which have expressed resistance to Verticillium wilt and other early dying diseases in tests conducted over a six-year period, 1977-82, comparing them with the reaction of susceptible Russet Burbank. Most promising lines for use as breeding parents are starred "*".

Line	Verticillium Wilt ^{1/}						Early Dying ^{1/}		Hort. ^{1/}		Seed ^{1/}		Other ^{4/}	
	1982	1981	1980	1979	1978	1977	Ave. ^{2/}	1982	1981	Rate	Type ^{3/}	Balls	Resistances	Resistances
R. Burbank	2.4	1.6	1.5	1.7	1.9	3.5	1.9(57)	2.5	1.8	2.7	Lg Rus	1.0	Sc?	
*Rosa	4.7						4.7(3)	3.5		3.0	Rnd Wh	1.3	Sc?, Y?, N?	
Manota	5.0						5.0(1)	4.5		2.3	Rnd Wh	1.0	Y?, LR?	
Alpha	4.0						4.0(1)	4.2		2.2	Obl Wh	1.0	N	
Katahdin	2.8						2.8(4)	3.4		3.9	Rnd Wh	2.3	Y, N?	
WnC285-18	3.1						3.4(15)	2.5		2.6	Lg Rus	1.1	Sc, LR?	
*WnC612-13	4.0	3.8	3.5	3.8	3.0	4.3	3.7(24)	2.7	2.0	3.6	Obl Buf	1.6		
Wn618-12	3.7	4.0	3.6	2.9	4.7		3.6(26)	4.0	3.8	2.8	Lg Rus	1.3	Sc, Y?, Sc1?	
Wn670-20	3.7		1.7	3.4			3.1(13)	2.3		2.7	Lg Rus	1.8	Sc, EB, PM	
Wn705-13		2.3	2.7	2.8	4.0	3.0	3.2(23)	3.0	2.0	3.1	Lg Buf	2.5	LR?, Sc1	
Wn705-57	4.5	3.3	3.3	3.6	4.2		3.8(25)		3.0	2.9	Obl Buf	1.7	EB, PM, Sc1	
*Wn705-64	4.0	4.3	2.0	3.9	4.4		4.0(27)	4.7	3.4	2.9	Obl Buf	2.8	LR?, EB, Sc1, PM	
Wn705-113			1.7	3.6	4.8		3.2(17)			2.4	Obl Buf	3.5	LR?, EB, Sc1, PM	
Wn705-114	3.0		3.7	4.0	4.5		3.7(13)			2.9	Obl Buf	2.4	Sc?, EB, Sc1, PM, N	
Wn705-250	4.0		4.5	3.5	4.0		4.0(9)	5.0		2.9	Obl Buf	1.0	EB?, PM	
Wn705-381	4.0		3.5	5.0	2.0		3.7(9)	4.0		2.3	Obl Buf	1.2	PM	
Wn705-413	4.3		5.0	4.0	3.0		4.3(9)	3.0		1.8	Rnd Wh	1.0	LR?, EB, PM, N?	
Wn705-495	3.6		3.3	3.0	4.0		3.4(14)	4.5		3.1	Obl Rus	1.1	EB?, PM	
*Wn705-576	4.7	2.0	4.7	4.0	5.0		4.4(13)	4.5		2.3	Obl Buf	2.9	Sc, LR?, EB, PM, N	
*Wn706-26	4.0	3.0	3.7	1.6	4.2	4.0	3.2(30)	4.5	2.0	3.2	Lg Buf	1.0	LR, Sc1, PM	
Wn708-27	3.5	3.1	4.0	2.6	3.7		3.2(31)	2.8	2.2	3.5	Obl Buf	1.4	EB, Sc1, PM	
*Wn720-50	4.8			5.3			5.0(7)	3.8		2.7	Lg Buf	2.1	EB, PM, N	
*Wn726-3	3.3		2.7	3.5	4.5		3.4(15)	5.0		2.5	Lg Rus	1.0	LR?, EB, PM, N	
Wn760s-2	4.5		3.3	2.3	4.0		3.4(16)	3.3		2.8	Lg Rus	1.0	LR?	
Wn770s-18	4.0	4.7					4.4(5)	4.5	4.0	2.5	Rnd Wh	1.6	N	
Wn770s-50	3.3	4.0	3.3				3.7(14)	3.2	2.0	2.6	Lg Wh	3.8	Sc1, N	
Wn780s-3	3.7						3.7(3)	4.4		1.8	Rnd Wh	2.5	N	
*Wn780s-16	5.3	3.0					4.8(4)	5.0		2.0	Obl Wh	1.5	Sc, EB, N	
Wn780s-25	4.8	2.5	3.5				3.9(8)	3.1	3.0	2.5	Obl Wh	2.4	Y?	
Wn780s-30	3.0	3.5					3.3(4)	4.0		3.1	Lg Wh	4.0	N	

Washington Table 1. (Cont.)

Line	Verticillium Wilt ^{1/}						Early Dying ^{1/}		Hort. 1/ Rate	Type ^{3/}	Seed ^{1/} Balls	Other ^{4/} Resistances
							Ave. 2/					
	1982	1981	1980	1979	1978	1977	1982	1981				
Wn78Ds-32	4.7	4.5					4.6(7)	5.0	4.5	4.7(7)	1.7	Ob1 Wh 1.0 N
Wn78Ds-40	3.5	3.3					3.4(5)	5.0	4.5	4.8(4)	1.5	Ob1 Wh 1.0 LR,EB
Wn78Ds-181	4.5	4.0	5.0				4.6(10)	3.8		3.8(5)	2.4	Rnd Wh 1.6 LR?,N?
Wn78Ds-300	4.5	5.0	4.0				4.6(9)	4.3		4.3(7)	3.2	Ob1 Buf 4.5 Sc,Y,EB,Sc1,N
Wn79Ds500-4	4.3	4.0					4.3(4)	3.8	3.0	3.7(6)	1.7	Lg Wh 1.3 Y?,Sc?,N
Wn79Ds500-7	4.0	4.0					4.0(3)	4.2	5.0	4.3(6)	2.4	Rnd Rus 3.4 LR?
Wn79Ds500-11	4.5	4.0					4.3(3)	3.8	3.5	3.7(7)	2.4	Ob1 Wh 2.4 EB
Wn79Ds500-15	4.0	4.0					4.0(4)	3.5	3.0	3.3(4)	2.0	Lg Wh 1.6 N
Wn79Ds500-20	4.5	3.0					3.8(4)	4.0	4.0	4.0(4)	2.6	Ob1 Wh 1.2 Y?,LR?,N
Wn79Ds500-25	4.7	5.0					4.8(4)	4.4	3.0	4.2(6)	2.7	Lg Wh 1.0 Sc?,N?
Wn79Ds501-5	4.7						4.7(3)	4.5		4.5(2)	2.3	Ob1 Wh 1.0 Sc?,LR,N?
Wn79Ds501-11	5.0	5.0					5.0(4)	5.0		5.0(2)	2.2	Lg Wh 1.5 Sc?,Y?,N
Wn80DsSg-2	4.7						4.7(3)	3.0	4.0	3.2(5)	2.3	Lg Wh 1.6 Sc?
Wn80DsSg-3	4.0						4.0(3)	5.0	2.0	3.5(2)	2.5	Lg Wh 1.0 Sc
Wn80DsSg-6	5.0						5.0(1)	5.5	5.0	5.3(3)	2.7	Lg Wh 1.0 Sc,Y,LR?,N
Wn80DsSg-7	4.0						4.0(1)	5.0	2.0	3.5(2)	2.5	Lg Wh 1.0 Sc
Wn80DsSg-9	4.0						4.0(3)	3.7	4.0	3.8(4)	3.0	Lg Wh 1.2 Sc,Y?
Wn80DsSg-15	3.0						3.0(1)	5.0	4.0	4.5(2)	2.5	Rnd Wh 1.0 Sc,N
Wn80DsSg-16	4.0						4.0(1)	6.0	4.0	5.0(2)	4.0	Ob1 Wh 1.5 Sc
Wn80DsBr-10	4.7						4.7(3)	5.0	4.0	4.5(2)	2.3	Lg Wh 1.0 Sc?,LR,N
Wn80DsBr14-1	4.0						4.0(1)	5.0	2.0	3.5(2)	3.0	Ob1 Rus 1.5 Sc,LR,N?
Wn80DsBr14-2	4.0						4.0(1)	6.0	2.0	4.0(2)	3.0	Rnd Wh 1.0 Sc,LR?,N
Wn80DsBr-17	2.5						2.5(2)	5.0	2.0	3.5(2)	3.3	Ob1 Wh 1.0 Sc,LR?,N?
Wn80DsBr-18	4.0						4.0(1)	5.0	2.0	3.5(2)	2.0	Lg Buf 1.0 Sc,Y
Wn80DsBr-23	4.0						4.0(1)	5.0	4.0	4.5(2)	3.0	Rnd Wh 2.0 Sc,LR,Y,N
Wn80DsBr-24	4.0						4.0(1)	5.0	4.0	4.5(2)	2.5	Ob1 Buf 1.5 Sc,N
Wn80DsBr-26	4.0						4.0(1)	4.0	4.0	4.0(3)	1.7	Lg Wh 2.0 Sc,LR?,Y?,N
Wn80DsBr-27	3.0						3.0(1)	5.0	4.0	4.5(2)	3.0	Ob1 Buf 1.0 Sc,LR
Wn80DsT3	4.0						4.0(1)	5.0		5.0(2)	1.7	Rnd Wh 1.0 LR?,Y?,N
Wn80DsT39	4.0	5.0					4.5(2)	3.3	5.0	4.0(5)	2.4	Lg Wh 2.8 Sc,Y?,EB,N?

Washington Table 1. (Cont.)

Line	Verticillium Wilt ^{1/}					Early Dying ^{1/}		Hort. ^{1/} Rate	Type ^{3/}	Seed ^{1/} Balls	Other ^{4/} Resistances	
	1982	1981	1980	1979	1978	1977	Ave. ^{2/}					
Wn80DSt42	5.0						5.0(1)	2.0	Lg Wh	1.0	Y	
Wn80DSt74	4.3						4.3(3)	1.8	Lg Wh	1.2	Sc?, Y, N	
Wn80DSt88	5.0						5.0(1)	2.0	Lg Wh	5.0	Sc, LR?, N?	
*Wn80DSt147	4.0	5.0					4.3(4)	2.9	Lg Buf	1.3	Sc, Y, EB, N?	
Wn80DSt159	3.0						3.0(1)	3.0	Lg Rus	2.0	-----	
A68113-4	3.0	3.5			3.8	3.0	3.5(15)	2.0	Lg Wh	1.1	LR	
*A69870-3	4.3						4.3(7)	3.3	Lg Rus	1.2	Sc, LR?, Y?, EB, N	
*A72545-2	4.0	3.8	4.8		4.0		4.1(18)	3.1	Lg Buf	1.3	Sc1	
A72685-2	4.3	3.0	2.0	2.0	2.7		2.9(23)	3.1	Lg Rus	1.1	Sc1	
A73400-3	2.7						2.7(3)	2.7	Ob1 Rus	1.0	Y?, N	
A73496-1												
A7411-2		2.5					4.0(2)	2.0	Ob1 Wh	3.0	Y, N?	
A74133-1	3.3						4.0(3)	3.5	Lg Rus	2.2	Sc?, LR?, Y, N?	
AD74212-1	3.3						3.3(12)	2.6	Ob1 Rus	3.3	Y?	
A74543-5	5.0		2.7	3.0			3.0(9)	3.1	Lg Rus	4.4	N	
							4.0(1)	3.2	Lg Buf	1.3	Y?	
A74708-7												
A74713-4	4.0	1.0					4.0(2)	2.0	Ob1 Wh	2.5	Y	
*A7596-1	4.3	4.0	4.3				3.6(5)	2.0	Rnd Buf	3.5	Sc?, Y	
*A75188-3	3.5	4.3					3.5(17)	2.7	Lg Rus	1.5	Sc, Sc1	
ADMn75197-14A4.0	4.0	4.0	4.5	2.5	3.0		3.7(11)	2.8	Lg Rus	3.8	Sc, EB, Sc1, N	
							3.4(10)	3.6	Ob1 Wh	3.0	Sc1, PM	
ADMn75197-14B5.0	5.0											
A75417-10	3.0	3.0					5.0(2)	4.3	Ob1 Rus	2.3	Sc?, EB, N	
A76100-4	3.5	3.5					3.7(3)	3.0	Lg Buf	1.0	LR?, Y	
A77131-5	4.0	3.5					2.8(6)	3.2	Lg Buf	3.3	-----	
A77182-3	3.0	3.6					3.9(11)	2.4	Lg Rus	2.3	Sc?, Y?	
							2.7(6)	2.6	Ob1 Rus	4.1	Sc, Sc1	
A77236-13	2.0	3.7										
A77265-6	3.0	3.0					2.8(6)	2.8	Lg Rus	1.3	Sc, LR?, N	
A77308-9	2.0						3.0(3)	2.8	Lg Rus	2.0	Sc, LR?	
*A77311-1	3.0						4.0(3)	3.3	Lg Rus	1.0	Sc?	
							3.0(1)	3.7	Lg Rus	4.5	LR?, Y?	
A77532-8	4.0	3.3					4.3(3)	3.0	Ob1 Rus	4.1	Sc, Y, EB?, N?	

Washington Table 1. (Cont.)

Line	Verticillium Wilt ^{1/}							Early Dying ^{1/}		Hort. 1/ Rate	Type ^{3/}	Seed ^{1/} 3/ Balls	Other ^{4/} Resistances
	1982	1981	1980	1979	1978	1977	Ave. 2/ 1982	1981	Ave. 2/ 1981				
A77533-3	4.0	3.8					3.8(6)	2.5	3.0	3.0	Ob1 Rus	4.2	Sc?, EB, Sc1
A77629-7	3.0						3.0(1)	3.0	3.0(3)	4.0	Lg Rus	2.5	LR?, Y?
A77727-1	3.3	3.3					3.3(6)	3.7	1.7	2.9	Lg Wh	1.4	-----
A7811-4	4.0						4.0(1)	3.7	3.7(3)	2.0	Ob1 Rus	1.0	Sc, Y
A7811-16	3.0						3.0(1)	3.7	3.7(3)	3.0	Lg Rus	1.0	Sc?
A7815-6	3.0						3.0(1)	3.3	3.3(3)	3.3	Lg Rus	1.0	Sc?, Y?
A7815-7	3.0						3.0(1)	3.3	3.3(3)	4.0	Lg Rus	2.0	Sc?, Y?
A7816-14	3.0						3.0(1)	4.7	4.7(3)	3.7	Lg Rus	1.5	Sc?, Y
A7822-3	4.0						4.0(1)	3.7	3.7(3)	4.0	Lg Wh	2.5	Sc, LR, Y
A7836-28	3.0						3.0(1)	3.0	3.0(3)	3.0	Lg Rus	1.0	Sc, Y
A7836-30	3.0						3.0(1)	3.3	3.3(3)	3.3	Ob1 Rus	1.0	Sc?
A7854-6	4.0						4.0(1)	2.3	2.3(3)	4.0	Lg Rus	1.5	Sc, N
A7865-19	3.0						3.0(1)	3.0	3.0(3)	3.3	Lg Rus	1.3	Sc, Y
A7869-9	3.0						3.0(1)	4.7	4.7(3)	2.0	Ob1 Rus	1.0	N
A7869-19	3.0						3.0(1)	4.0	4.0(3)	3.3	Lg Rus	1.0	Sc?
A7869-20	3.0						3.0(1)	3.7	3.7(3)	2.7	Ob1 Rus	1.0	Sc?
A7870-1	4.0						4.0(1)	4.7	4.7(3)	2.0	Ob1 Rus	2.0	LR?, Y
A7873-1	4.0						4.0(1)	5.0	5.0(3)	5.0	Ob1 Rus	1.3	Sc, Y
A7896-1	3.0						3.0(1)	4.0	4.0(3)	3.3	Lg Rus	1.3	Sc, Y?, N
A78100-7	4.0						4.0(1)	4.3	4.3(3)	4.0	Lg Rus	3.5	Sc, Y, N
A78100-11	3.0						3.0(1)	3.3	3.3(3)	4.0	Lg Rus	1.5	Sc?, Y?, N
A78102-5								3.7	3.7(3)	4.0	Lg Rus	2.0	Y, LR?, N
A78105-5	3.0						3.0(1)	4.0	4.0(2)	3.3	Lg Wh	2.3	N
A78239-1	3.0						3.0(1)	3.0	3.0(3)	3.8	Ob1 Rus	1.5	Sc, Y
A78243-1	2.0						2.0(1)	4.0	4.0(3)	4.5	Ob1 Rus	3.5	Sc, Y
ATD63-2	4.0						4.0(1)	4.0	4.0(3)	1.2	Rnd Wh	1.0	N
AK38-2	2.7						2.7(3)	4.0	4.0(2)	2.0	Ob1 Wh	1.0	LR, N?
ALR4-1	3.3				3.0		3.2(5)	2.0	2.0(4)	4.1	Lg Wh	1.3	Sc
*BC9289-1	3.4						3.4(7)	3.0	3.0(8)	2.7	Ob1 Rus	1.0	Sc?, Y, N?
DT0-2 CIP		4.0					4.0(1)	5.0	5.0(1)	3.0			

Washington Table 1. (Cont.)

Line	Verticillium Wilt ^{1/}						Early Dying ^{1/}		Hort. 1/ Rate	Type ^{3/}	Seed ^{1/} / Balls	Other ^{4/} / Resistances
	1982	1981	1980	1979	1978	1977	Ave. 2/ 1982	Ave. 2/ 1981				
F67128												
JB1-3	5.0						3.5	3.5(2)	4.0	Rnd Wh	1.0	Y
MeAF221-1							4.0	4.0(4)	2.0	Rnd Wh	4.8	N
NDD 34-2	4.0	3.0	4.0	4.0	1.0		4.5	4.5(2)	3.0	Lg Buf	1.0	Y
NDD47-1	3.5	4.0	4.4	3.5	2.7		3.0	2.3(6)	2.8	Lg Buf	4.5	PM,N?
							3.0	2.7(6)	3.0	Obl Buf	4.1	EB?,PM,N
NDA992-1	1.0						4.0	4.0(3)	3.3	Rnd Wh	2.5	LR,Y?
NDA1067-1	3.0						3.0	3.0(3)	2.7	Rnd Wh	3.3	Y?
NDA1141-4	2.0						5.0	5.0(3)	1.7	Rnd Wh	1.0	Y
NDA1235-2	1.0						3.7	3.7(3)	4.0	Rnd Wh	1.8	LR,Y
*NY59	4.3						5.0	5.0(4)	3.6	Rnd Wh	1.0	LR?,Y,N?
NY63	2.0						3.8	3.8(4)	3.5	Rnd Wh	1.0	LR?,Y,N
NYA158-1	5.0						4.3	4.3(3)	2.7	Rnd Wh	3.0	LR?,Y,N
NYA158-4	4.0						3.3	3.3(3)	2.0	Rnd Wh	4.0	LR?,Y?
NYR247-1	3.0	3.5					3.2	3.0(7)	2.1	Rnd Wh	3.0	Y,N
*IP12-1-27	5.3	5.0					4.8	4.6(5)	2.8	Obl Wh	1.0	Y,EB,N
IP12-1-28	4.5	5.0					4.1	4.1(8)	1.9	Obl Wh	1.9	EB,N
IP13-3	4.5	5.0					4.3	4.2(5)	2.1	Obl Wh	1.1	EB,N
IP17-100	4.3	5.0					3.0	3.2(3)	1.8	Rnd Wh	1.0	N

FOOTNOTES:

1/ Resistance to Verticillium wilt and early dying rated on 1 to 5 scale with 1 = very susceptible and 5 = very resistant. Overall horticultural potential rated on 1 to 5 scale with 1 = very poor and 5 = very good. Presence of open-pollinated seedballs on field grown plants rated on 1 to 5 scale with 1 = none and 5 = very heavy set.

2/ Average of all data collected on resistance to Verticillium wilt or early dying. Early dying is the combined effects of Verticillium and Sclerotinia wilts, early blight, powdery mildew, PVY current season necrosis, early maturity and any stress factors. Number in parenthesis is the total number of plots (replications) observed.

3/ General tuber type. Lg = long, Rus = russet, Rnd = round, Wh = white, Obl = oblong, Buf = buff.

4/ Resistances observed in other nurseries or trials. Sc = common and deep-pitted scab, Y = PVY, LR = PLRV, N = Northern and Columbia root-knot nematodes, primarily the latter, EB = early blight, PM = powdery mildew, Scl = Sclerotinia wilt. Question mark denotes preliminary results where further testing is needed.

Washington Table 2. List of lines which have expressed resistance to Columbia and Northern root-knot nematodes when grown in nematode infested field soil from 1980 to 1982, compared to susceptible Russet Burbank. Lines promising as breeding parents are starred "*".

Line	Resistance--1982 ^{1/}				1981	1980	Hort. ^{1/}	Tuber	Seed ^{1/}	Other ^{4/}
	RI	RII	RIII	Ave. ^{2/}	Ave. ^{2/}	Ave. ^{2/}	Rating	Type ^{3/}	Balls	Resistances
R. Burbank	1.1	1.5	2.5	1.7(31)	1.8(4)	1.5(4)	2.7	Lg Rus	1.0	Sc?
Norgold		2.4	4.7	3.6(20)	4.0(4)		2.8	Obl Rus	1.0	Sc
Norgold M	5.0	5.0	5.0	5.0(13)	2.8(4)		2.8	Obl Rus	1.0	Sc
Rosa	4.2	4.6	2.4	3.7(25)			3.0	Rnd Wh	1.3	Sc?, Y?, Ve
Sebago	3.8			3.8(10)			2.1	Obl Wh	3.9	Sc?, Ve?
Patrones	5.0			5.0(10)			1.8	Lg Wh	1.1	Sc?
Alpha	4.7			4.7(7)			2.2	Obl Wh	1.0	Ve?
Katahdin	5.0	3.5	2.6	3.4(25)			3.9	Rnd Wh	2.3	Y, Ve?
WnC630-2	1.0	5.0	4.6	3.5(30)			2.8	Lg Rus	4.6	Y?, Sc
*Wn705-576	3.2	4.1	5.0	4.1(30)		4.0(3)	2.3	Obl Buf	2.9	Sc?, LR?, Ve
*WnC708-6	3.5	4.0	4.2	3.9(30)			2.3	Obl Rus	2.6	Sc, Y?
*Wn720-50		5.0	5.0	5.0(10)			2.7	Lg Buf	2.1	Ve
Wn726-3	4.0	1.0	4.2	3.6(19)			2.5	Lg Rus	1.0	LR?, Ve
Wn77Ds-18	4.8	5.0	5.0	4.9(13)			2.5	Rnd Wh	1.6	Ve
*Wn77Ds-39	5.0		5.0	5.0(15)	5.0(2)	3.8(4)	2.4	Lg Rus	1.0	Sc
*Wn77Ds-50		4.8	5.0	4.9(20)			2.6	Lg Wh	3.8	Ve
Wn78Ds-3	5.0	5.0	5.0	5.0(22)			1.8	Rnd Wh	2.5	Sc?, Ve
Wn78Ds-32	1.3	4.6		3.6(14)	4.0(2)		1.7	Obl Wh	1.0	Ve
*Wn78Ds-300	4.6	4.4	5.0	4.7(27)			3.2	Obl Buf	4.5	Sc, Y?, Ve
Wn79Ds500-20	1.7	5.0	5.0	3.9(30)			2.6	Obl Wh	1.2	Ve
Wn79Ds500-25	2.0	5.0	3.7	3.5(26)			2.7	Lg Wh	1.0	Sc, Ve
Wn79Ds501-5	2.0	4.1	5.0	3.7(30)			2.3	Obl Buf	1.0	Sc?, LR?, Ve
*Wn79Ds504-11	5.0	4.7	5.0	4.9(30)			2.2	Lg Wh	1.5	Sc, Y?, Ve
Wn79Ds504-50	5.0	4.6	4.9	4.9(22)			1.7	Lg Wh	1.3	Ve
Wn80DsSg-6	4.8			4.8(10)			2.7	Obl Wh	1.0	Sc, LR?, Ve
Wn80DsSg-8	4.6			4.6(10)			1.5	Rnd Wh	1.2	Sc, Ve
Wn80DsSg-15	4.6			4.6(10)			2.5	Rnd Wh	1.0	Sc, Ve
Wn80DsBr-5	5.0	4.6		4.7(15)			2.5	Lg Rus	1.0	Sc
Wn80DsBr-9	5.0			5.0(8)			2.5	Obl Rus	1.0	Sc, LR?
*Wn80DsBr-10	4.8	4.7	4.3	4.6(26)			2.3	Lg Wh	1.0	Ve, LR
Wn80DsBr-14A	3.5			3.5(10)			3.0	Obl Rus	1.5	Sc, LR?, Ve
Wn80DsBr-14B	5.0			5.0(10)			3.0	Rnd Wh	1.0	Sc, LR?, Ve
Wn80DsBr-17	3.0	4.3		3.7(20)			3.3	Obl Wh	1.0	Sc, Ve?
Wn80DsBr-23	4.5			4.5(10)			3.0	Rnd Wh	2.0	Sc, LR, Y, Ve
Wn80DsBr-24	5.0			5.0(8)			2.5	Obl Buf	1.5	Sc, Ve
Wn80DsBr-26	5.0			5.0(10)			1.7	Lg Wh	2.0	Sc, LR?, Ve
Wn80DsT3	5.0	5.0		5.0(9)			1.7	Rnd Wh	1.0	Ve
Wn80DsT74	4.3	5.0		4.8(16)			1.8	Lg Wh	1.2	Sc, Y, Ve
A66102-16	2.8	5.0	5.0	4.2(27)			2.6	Lg Wh	4.4	-----
A67142-1	2.1	4.8	5.0	4.0(30)			3.1	Lg Wh	2.0	-----

Washington Table 2. (Cont.)

Line	Resistance--1982 ^{1/}				1981	1980	Hort. ^{1/}	Tuber	Seed ^{1/}	Other ^{4/}
	RI	RII	RIII	Ave. ^{2/}	Ave. ^{2/}	Ave. ^{2/}	Rating	Type ^{3/}	Balls	Resistances
A68588-16	2.0	5.0	5.0	4.1(20)			2.9	Rnd Wh	1.0	-----
A69657-4	2.4	4.8	5.0	4.1(30)	4.0(1)		3.0	Lg Wh	2.6	Sc?
A69850-4	2.0	5.0	5.0	3.7(18)			2.9	Lg Wh	3.0	Sc
A69870-3	2.9	5.0		4.0(20)			3.3	Lg Rus	1.2	Sc, LR?, Y?, N, Ve
AD7267-1	1.5	5.0	5.0	3.5(24)	4.5(2)		3.5	Lg Buf	3.9	Sc?
*A7273-3	3.0	5.0	4.8	4.3(30)			3.5	Lg Rus	1.1	Sc
A72320-35	1.3	4.7	5.0	3.6(30)			2.4	Lg Rus	1.7	-----
A72602-2	1.1	4.0	3.9	3.0(25)			3.0	Lg Rus	2.6	Sc
A73400-3	3.2	4.3	4.6	4.0(28)			2.7	Ob1 Rus	1.0	Y?, Ve
A73496-1	3.4			3.4(10)			2.0	Ob1 Wh	3.0	Y, Ve
A7411-2	3.3			3.3(10)			3.5	Lg Rus	2.2	Sc?, LR?, Y, Ve
A74212-1	3.0	5.0		4.5(8)			3.1	Lg Rus	4.4	Ve
*A74393-1	5.0	5.0	5.0	5.0(24)			3.6	Ob1 Rus	3.4	Sc, Ve
A74771-4	3.6	5.0		4.3(20)			2.6	Ob1 Wh	2.5	-----
*A75188-3	3.0	5.0	5.0	4.1(22)	4.0(1)		2.8	Lg Rus	3.8	Sc, Ve
ADWn75197-14										
	5.0			5.0(4)			4.3	Ob1 Rus	2.3	Sc, Ve
*ADWn75201-12										
	4.8	5.0		4.9(8)	4.5(2)		3.0	Lg Wh	1.0	Sc?
A77236-13	4.6	5.0	1.6	3.3(23)	5.0(1)		2.8	Lg Rus	1.3	Sc, LR?, Ve?
A7854-6	4.5			4.5(10)			4.0	Lg Rus	1.5	Sc, Ve?
A7856-6	4.6			4.6(10)			3.7	Ob1 Rus	2.8	Sc, Y, Ve?
A7858-7	4.1			4.1(10)			3.7	Ob1 Rus	1.3	Sc?, Y
A7865-23	4.3			4.3(10)			2.7	Lg Buf	1.0	Sc
A7881-8	4.5			4.5(8)			3.0	Lg Rus	1.8	Sc, Y?
A7888-1	5.0			5.0(10)			1.7	Ob1 Buf	1.5	Ve?
A7896-7	4.5			4.5(11)			3.3	Lg Rus	1.3	Ve?
A78100-7	5.0			5.0(10)			4.0	Lg Rus	3.5	Sc, Y, Ve
A78100-11	4.0			4.0(10)			4.0	Lg Rus	1.5	Sc?, Y?, Ve
A78102-5	5.0			5.0(10)			4.0	Lg Rus	2.0	LR?, Y, Ve
A78105-5	5.0			5.0(10)			3.3	Lg Wh	2.3	Ve
A78164-7	4.1			4.1(7)			2.0	Ob1 Wh	1.0	Y
ADX195-3	5.0			5.0(10)			1.0	Ob1 Wh	1.0	Y, LR?, Ve
ADX270-3	4.7			4.7(9)			1.0	Ob1 Red	1.0	-----
ADX335-1	4.8			4.8(10)			1.0	Ob1 Pur	1.0	-----
ATD63-2	4.3			4.3(9)			1.2	Rnd Wh	1.0	Ve
ATD63-3	3.9			3.9(10)			1.2	Rnd Wh	1.0	Y
AK38-2	3.1	4.9	3.0	3.5(27)			2.0	Lg Wh	1.4	LR?, Ve
B8833-6	3.8			3.8(10)			1.5	Ob1 Buf	3.7	-----
BC9289-1	2.5	5.0		3.8(20)			2.7	Ob1 Rus	1.0	Sc, Y, Ve
C7306-12R	3.3			3.3(8)			3.5	Lg Rus	1.0	Sc?, LR, Y
G654-2	4.2			4.2(5)			2.7	Rnd Wh	1.0	Sc?, LR, Y
IP12-1.25	1.3	5.0	5.0	3.8(30)			1.7	Lg Wh	1.3	Sc, Ve
*IP12-1.27	3.2	5.0	5.0	4.2(22)			2.8	Ob1 Wh	1.0	Y?, Ve
*IP12-1.28	5.0	5.0	5.0	5.0(25)			1.9	Ob1 Wh	1.9	Ve

Washington Table 2. (Cont.)

Line	Resistance--1982 ^{1/}				1981 Ave. ^{2/}	1980 Ave. ^{2/}	Hort. ^{1/} Rating	Tuber Type ^{3/}	Seed ^{1/} Balls	Other ^{4/} Resistances
	RI	RII	RIII	Ave. ^{2/}						
IP17-100	3.3	3.7	5.0	4.0(28)			1.9	Obl Wh	1.0	Ve
JB1-3	4.3			4.3(10)	5.0(1)		2.0	Rnd Wh	4.8	Ve
LS2941-5	3.3			3.3(9)			1.5	Rnd Wh	3.8	LR?, Y, Ve?
LT-1 CIP	5.0	5.0		5.0(11)			2.5	Rnd Wh	2.0	Y?
*ND14-1	4.2	5.0	3.9	4.4(30)	4.5(2)	3.5(2)	2.7	Lg Rus	2.7	Sc?, LR?, Y
NDD34-2	1.7	4.4	3.5	3.7(23)	4.0(2)		2.8	Obl Wh	4.5	-----
*NDD47-1	3.0	5.0	4.5	4.6(22)	4.5(2)		3.0	Obl Buf	4.1	Ve
*ND534-4R	4.1	5.0	5.0	4.7(30)			4.5	Lg Rus	1.3	Sc, Y?
*ND722-2R	4.3	5.0	4.8	4.7(30)	5.0(1)		2.9	Obl Rus	1.4	Sc
NDA848-3	5.0	5.0		5.0(8)	5.0(1)		2.4	Obl Buf	1.9	Sc
NDA938-1	4.1			4.1(10)			2.3	Rnd Wh	1.0	Y?, Ve?
NDA8694-3	3.8			3.8(10)			2.7	Obl Rus	2.4	LR?
*Neb169-69-1										
	4.5	5.0		4.9(14)	4.5(4)	4.3(4)	2.6	Rnd Wh	4.3	-----
*Neba21970-3										
	2.8	4.9	5.0	4.2(30)	4.5(2)	4.5(2)	2.4	Obl Buf	2.2	-----
NY59	2.0	5.0	4.4	3.8(30)			3.6	Rnd Wh	1.0	Sc?, Y, Ve
NY63	5.0	5.0		5.0(14)			3.5	Rnd Wh	1.0	Sc?, Y, Ve
NYR112-1	4.6	5.0	4.0	4.6(14)			3.0	Rnd Wh	1.0	Y?
NYA128-1	3.3			3.3(10)			2.0	Rnd Wh	2.2	Y
NYA140-2	4.6			4.6(10)			1.4	Rnd Wh	1.4	-----
NYA146-9	4.6			4.6(10)			3.0	Rnd Wh	2.0	Y?
NYA158-1	5.0			5.0(10)			2.7	Rnd Wh	3.0	Y?, Ve
NYA225-8	4.8			4.8(9)			1.3	Rnd Wh	2.3	Y?
NYA231-1	3.8			3.8(10)			3.0	Rnd Wh	3.0	LR?, Y?
NYA233-1	4.6			4.6(10)			1.7	Rnd Wh	1.5	Y?
*NYR247-1	5.0	5.0	5.0	5.0(28)			2.1	Rnd Wh	3.0	Y?, Ve?
X927-3	4.1			4.1(10)			2.5	Obl Wh	3.3	SC?, Y, Ve?

1/ Resistance to root-knot nematodes, mostly Columbia species, rated on 1 to 5 scale with 1 = very susceptible and 5 = very resistant. Horticultural potential and seedballs rated the same as in Table 1.

2/ In 1982, each tuber rated individually. Total number of tubers evaluated shown in parenthesis. In 1980 and 1981, each replication given an overall rating for nematode damage. Number of replications evaluated shown in parenthesis.

3/ Tuber type described with same terms used in Table 1.

4/ Resistances observed in other nurseries or trials. Same abbreviations as in Table 1.

Washington Table 3. List of lines which have expressed resistance to PVY in tests conducted during 1981 and 1982, compared to susceptible Russet Burbank. Promising breeding parents are starred "**".

Line	PVY Response ^{1/}				Hort. ^{2/} Rating	Tuber ^{3/} Type	Seed ^{2/} Balls	Other ^{4/} Resistances
	CS	Chr	Host	ELISA				
R. Burbank	+	++	++	++	2.7	Lg Rus	1.0	Sc?
LC-1	0	0?	+	+	3.3	Lg Rus	3.2	Sc, LR
Kennebec	0	+	+	0	3.8	Ob1 Wh	1.0	-----
Penobscot	0?				1.8	Ob1 Wh	1.3	LR?
Manota	0?				2.3	Rnd Wh	1.0	LR?, Ve
Katahdin	0				3.9	Rnd Wh	2.3	Ve?, N?
Teton	0				4.0	Rnd Wh	2.0	-----
WnC567-1	0				3.1	Lg Rus	1.1	Sc, LR?
*Wn78Ds705-168	0	0	+	+	3.0	Lg Rus	2.0	-----
Wn78Ds-9	0	0?	+	0	1.6	Ob1 Wh	1.0	Ve
Wn78Ds-16	0?	0	+	+	2.0	Ob1 Wh	1.5	Sc, Ve, N?
*Wn78Ds-24	0	0	+	0	4.0	Ob1 Rus	1.0	LR?
Wn78Ds-25	+	0?	+	0?	2.5	Ob1 Wh	2.4	-----
Wn78Ds-42	0	+	0	0?	1.0	Ob1 Buf	1.0	LR?
*Wn78Ds-99	0	0	+	0	2.8	Ob1 Buf	2.0	-----
Wn78Ds-300	+	0	+	+	3.2	Ob1 Buf	4.5	Sc, Ve, N
Wn79Ds500-42	+	0	0	+	2.2	Ob1 Buf	1.5	Ve?
Wn80DsBr-11	0?				3.0	Lg Rus	1.0	Sc, LR?, Ve?
Wn80DsBr-18	0?				2.0	Lg Rus	1.0	Sc, Ve
Wn80DSBr-23	0				3.0	Rnd Wh	2.0	Sc, LR, Ve, N
Wn80DsT39	0?	0			2.4	Lg Wh	2.8	Sc, EB, N?
Wn80DsT42	0				2.0	Lg Wh	1.0	Ve
Wn80DsT74	0				1.8	Lg Wh	1.2	Sc, Ve, N
A73496-1	0				2.0	Ob1 Wh	3.0	Ve, N?
A7411-2	0				3.5	Lg Rus	2.2	Sc?, LR?, Ve, N?
A75122-16	0				3.4	Lg Wh	3.3	-----
A77267-11	0				3.7	Ob1 Rus	1.0	Sc
A77311-1	0				3.7	Lg Rus	4.5	Sc, LR?, Ve
A7805-8	0				2.3	Lg Rus	1.3	Sc?, Ve?
A7811-4	0?				2.0	Ob1 Rus	1.0	Sc, Ve
A7817-1	0				3.3	Lg Rus	1.0	Sc, Ve?
A7836-7	0				2.7	Ob1 Rus	1.0	-----
A7836-28	0?				3.0	Lg Rus	1.0	Sc, Ve?
A7847-7	0?				3.3	Ob1 Rus	1.0	Sc
A7856-6	0				3.7	Ob1 Rus	2.8	Sc, Ve?, N
A7858-7	0				3.7	Ob1 Rus	1.3	Sc?, N
A7865-19	0				3.3	Lg Rus	1.3	Sc, Ve?
A7870-1	0				2.0	Ob1 Rus	2.0	LR, Ve
A7873-1	0				5.0	Ob1 Rus	1.3	Sc, Ve
A78100-7	0				4.0	Lg Rus	3.5	Sc, Ve, N

Line	PVY Response ^{1/}				Hort. ^{2/} Rating	Tuber Type ^{3/}	Seed ^{2/} Balls	Other ^{4/} Resistances
	CS	Chr	Host	ELISA				
A78102-5	0				4.0	Lg Rus	2.0	LR?,Ve,N
A78164-7	0				2.0	Obl Wh	1.0	-----
A78239-1	0				3.8	Obl Rus	1.4	Sc,Ve
A78242-4	0?				2.0	Obl Rus	1.8	Sc,LR
A78243-1	0				4.5	Obl Rus	3.5	Sc,Ve?
ADX370-9	0	0	+	0?	1.0	Lg Red	1.0	-----
ADX421-1	0	+	+	0	1.0	Lg Red	1.0	LR?
*AK26-8	0	0?	0?	+	3.0	Obl Rus	1.8	Sc
ATD63-4	0				1.6	Rnd Buf	1.0	-----
BC9289-1	0?				2.7	Obl Rus	1.0	Sc,Ve,N?
B9391-2	0				3.0	Obl Rus	1.0	-----
B9399-1	0				2.0	Obl Buf	1.0	-----
B9523-10	0				2.5	Obl Buf	1.0	-----
C7306-12R	0				3.5	Obl Rus	1.0	Sc?,LR,N?
F67128	0				4.0	Rnd Wh	1.0	Ve
F70021	0				4.0	Obl Wh	2.0	-----
FS6222	0				4.0	Rnd Wh	2.0	-----
G654-2	0				2.7	Rnd Wh	1.0	Sc,LR
*LT-1CIP	0?	+	0	0	2.5	Rnd Wh	2.0	-----
MeAF221-1	0				3.0	Lg Wh	1.0	Ve
ND534-4R	0?				4.5	Lg Rus	1.3	Sc,N
NDA945-2	0?				2.7	Rnd Wh	1.5	Ve?
NDA1141-5	0?				1.7	Rnd Wh	1.0	Ve
NDA1235-2	0				4.0	Rnd Wh	1.8	LR,Ve
NY59	0				3.6	Rnd Wh	1.0	Sc?,Ve?,N?
NY63	0				3.5	Rnd Wh	1.0	Sc?,Ve,N
*NYR112-1	0	0?	+	0	3.0	Rnd Wh	1.0	N
NYA140-11	0				2.7	Rnd Wh	2.8	-----
NYA158-1	0?				2.7	Rnd Wh	3.0	Ve,N
NYA236-2	0				2.0	Rnd Wh	3.0	Ve?,N?
*NYR241-16	0	0	0?	0	2.5	Rnd Wh	2.3	LR,Ve?
NYR247-7	0	0?	+	0	2.5	Rnd Wh	2.3	-----
X927-3	0				2.5	Obl Wh	3.3	Ve?,N

1/ CS = current season necrosis, Chr = chronic Y mosaic the following season, Host = Host indexing of sprouted tubers during the winter after field inoculation, using the index host plants *Nicotiana debneyi*, *Nicotiana tabacum* var. *Xanthi* nc and *Solanum demissum* PI 230579 (Indicator Y), ELISA = Indexing of same sprouted tubers using the ELISA technique. In each case "0" = no reaction, "+" = positive reaction, with question marks denoting questionable reactions or symptoms.

2/ Horticultural potential and seedballs rated same as in Table 1.

3/ Tuber type described with same terms used in Table 1.

4/ Resistances observed in other nurseries or trials. Same abbreviations as in Table 1.

Washington Table 4. List of lines which have expressed resistance to PLRV when tested under severe exposure in disease nurseries during the period 1976 to 1982, compared with susceptible Russet Burbank. Promising breeding lines are starred "*".

Line	Response to PLRV ^{1/}				Hort. ^{2/} Rating	Tuber Type ^{3/}	Seed ^{2/} Balls	Other ^{4/} Resistances
	CS	Chr	ELISA	Net				
R. Burbank	++	++	++	++	2.7	Lg Rus	1.0	Sc?
*LC-1	0	0	0	0	3.3	Lg Rus	3.2	Sc, Y
*BelRus	0?	0?	0	0	2.7	Lg Rus	1.2	-----
*Allagash	0	+	0	0	2.6	Obl Rus	1.1	-----
*Cascade	0		+	0	3.4	Obl Wh	1.2	-----
Pennrose	0?			+	3.0	Rnd Red	3.4	Sc?
Abinaki	0?			0	3.2	Obl Wh	1.0	-----
Delta Gold	+	+	0	0	2.8	Rnd Wh	3.0	Sc?, Ve?
*WnC316-1	0	0	+		2.9	Obl Rus	4.2	Sc?
*Wn705-13	0	0	0	+	3.1	Lg Buf	2.5	Ve?, Sc1
Wn76Ds-2	+	0?		0?	2.8	Lg Rus	1.0	Ve?
Wn78Ds-24		+	0	0?	4.0	Obl Rus	1.0	Y
*Wn78Ds-40	0	0	0	0?	1.5	Obl Wh	1.0	Ve
*Wn79Ds500-18	+	0	0	0?	2.0	Obl Buf	1.0	-----
Wn79Ds500-19		+		0	2.3	Lg Buf	1.0	-----
Wn79Ds500A-7		0	0	++	2.3	Obl Buf	1.0	-----
Wn79Ds501-5	0?			+	2.3	Obl Buf	1.0	Sc?, Ve
Wn80DsSg-11	0			0	2.0	Lg Rus	1.0	Sc
Wn80DsBr-11	0?			0	3.0	Lg Rus	1.0	Sc, Y, Ve?
Wn80DsBr-23	0			++	3.0	Rnd Wh	2.0	Sc, Y, Ve, N
Wn80DsBr-27	0?			++	3.0	Obl Rus	1.0	Sc, Ve
A69870-3	0?			++	3.3	Lg Rus	1.2	Sc, Y?, Ve, N
*A711076-9		0	0	0?	2.8	Lg Rus	1.0	Ve?
*A73373-6		0	0	0?	3.2	Obl Rus	2.3	Sc?
*A7712-5	+	0	0	+	2.2	Obl Rus	1.0	Ve, Sc
*A77230-9		0	0?	++	2.5	Lg Rus	1.0	-----
*A77230-11		0	+	0?	3.0	Lg Rus	2.0	Sc
A77232-3	+	0	+	0?	3.3	Lg Rus	1.0	Sc
A77265-6	0	+		0?	2.8	Lg Rus	2.0	Sc, Ve?
A77311-1	+			0	3.7	Lg Rus	4.5	Sc, Y, Ve
*A77586-10		0	0	+	4.0	Lg Rus	1.0	-----
A7822-3	0			0	4.0	Lg Wh	2.5	Sc, Y, Ve
A7870-1	0?		+	0?	2.0	Obl Rus	2.0	Y, Ve
A78242-4	0			0?	2.0	Obl Rus	1.8	Sc, Y
C7306-12R	0			+	3.5	Lg Rus	1.0	Sc?, Y, N?
DT0-33CIP		0	+		2.0	Rnd Wh	1.0	Ve?
G654-2	0			0?	2.7	Rnd Wh	1.0	Sc?, Y, N
ND14-1		+	0	+	2.7	Lg Rus	2.7	Sc, Y, N
*ND400-2R		0	0	0	2.8	Lg Rus	1.0	Sc
NDA992-1	0?			+	3.3	Obl Wh	2.5	Ve
NDA1235-2	0?			0?	4.0	Rnd Wh	1.8	Y, Ve?
*NYR241-16		0	0	0?	2.5	Rnd Wh	2.3	Y, Ve?
Okla4890-A3		0	0		1.0	Wild	1.0	Ve?

1/ CS = current season purple top, Chr = chronic leafroll the following season, ELISA = indexing of sprouted tubers during the winter after field inoculation, using the ELISA technique, Net = tubers examined for presence of net necrosis in storage following field inoculation. In each case, "0" = no reaction, "+" = positive reaction, with question marks denoting questionable reactions or symptoms.

2/ Horticultural potential and seedballs rated same as in Table 1.

3/ Tuber type described with same terms used in Table 1.

4/ Resistances observed in other nurseries or trials. Same abbreviations as in Table 1.

WEST VIRGINIA

R. J. Young

Potato Late Blight

The late blight trials for 1982 were conducted on the West Virginia Agriculture and Forestry Experiment Station Farm located at Reedsville, West Virginia. This farm is located at 1760' elevation (528 meters) on a deep atkins loam soil. Rain fall from May through July was nearly normal, averaging about 5 inches (126.25 mm) per month, while only 2.2 inches (55 mm) fell during August. Mean daily high temperatures for July and August (critical period for late blight) were 80.7 (27.05° C) and 76.4° F (24.4° C), respectively. The combined effects of low rain fall and high daily temperatures from July 25 through August 31 resulted in less than optimum weather conditions for the late blight disease.

Test clones were hand planted into preformed rows on May 6. Spacing between rows and between plants within rows measured 90 cm (36 inches), and about 23 cm (9 inches), respectively. The fertilizer application was split, a preplant application of 500 lbs of 10-20-20 broadcast and disced down while an additional 1000 lbs (10-20-20) was placed in the furrows. Furadan 10G was incorporated into furrows at the Manufacturers recommendations. Potato foliage was sprayed at 14 day intervals with insecticide for maintenance, and no fungicides were applied. Clones were evaluated as eight hill non-replicated plots. The test plot consisted of four seedling rows while Katahdin seed (inoculator plants) was planted in two outside boarder rows. These inoculum-source-plants were inoculated with a suspension of zoospores/sporangia of P. infestans race - 1,4 on July 24, 1983. Late blight developed quite rapidly for approximately three weeks following inoculation, but slowed as unfavorable weather conditions prevailed.

Four foliar evaluations were made, but only three are presented in the accompanying table. Plant foliage was determined as being either susceptible, immune, or resistant. Resistance is used here to indicate levels of multigenic resistance. Plant foliage was evaluated, when possible, early in the mornings, to better evaluate sporulation.

West Virginia Table 1. Evaluation of seedling clones and varieties for resistance to Race 1,4 Phytophthora infestans. 1982.

Field No.	Pedigree	Foliar Reaction						Disease Reaction			
		8/6/82		8/16/82		8/31/83					
		LB	PC	Spor. 1/	LB	PC	Spor. 1/	LB	PC	Spor. 1/	
<u>Varieties</u>											
1524	Abnaki	4+	4-	9, L&S	5+	1+	9, L&S	6	1	-	VS
1414	Alagash Russet	4	3	9, M&S	5+	1+	8+, L&S	6-	1+	9, L&S	VS
1527	Alamo	3+	5	8, L&S	4+	3	8, L&S	6	1	-	S
1576	Atlantic	3+	6	8, L&S	4+	4	8, L&S	6-	1+	9, L&S	S
1344	Atzimba	1	7+	1	1	7	1	1	7+	1	I
1462	Avon	3	6+	9, L&S	4+	4	8, L&S	6	1	-	S
1326	Belchip	2	7	9, L&S	4+	3	8+, L&S	5+	1+	9, L&S	S
1338	BelRus	4-	5	9, L&S	6	1	-	6	1	-	VS
1387	Bertita	1	7	1	1	7	1	1	5	1	I
1536	Boone	2+	7+	8, L&S	2+	7	7, L&S	4-	3	8, L&S	MR
1324	Buckskin	3-	7	8+, L&S	2+	7	8, M&S	3+	6	9, L&S	MR
1336	Butte	3-	7	9, L&S	5-	3	8+, L&S	5+	1+	9, L&S	S
1303	Calrose	1+	8	3	1+	7+	1+	2+	7	5, S&R	HR
1323	Campbell 13	3-	6	9, L&S	4+	3	8+, L&S	6	1	-	S
1553	Cascade	4-	5	8, L&S	4+	2+	8+, L&S	6	1	-	VS
1337	Centennial Russet	4-	5	6, L&S	4+	2	8+, L&S	6	1	-	VS
1530	Cheppewa	4+	4	8, L&S	5-	3	8, L&S	6	1	-	VS
1461	Cherokee	4+	4	9, L&S	5+	2	8+, L&S	4+	2+	9, L&S	VS
1334	Chipbelle	3+	4	9, L&S	4+	3	8, L&S	6	1	-	S
1577	Croatian	2	6+	6+, L&S	4	4-	7, L&S	6	1	-	S
1459	Delus	3+	6	7, L&S	4+	4	7, L&S	6-	1+	8, L&S	S
1496	Denali	4	5	9, L&S	5	5	9, L&S	6-	1+	9, L&S	VS
1406	Doritita	1	8+	1	1	8+	1	1	7	1	I
1407	Elenita	1	6	1	1	4-	1	-	1	-	I
1458	Essex	2+	8	7, L&S	4	3	7, L&S	6	1	-	S
1457	Fundy	4+	3	9, L&S	5+	2+	7, L&S	6	1	-	VS
1498	Green Mtn. (R _O)	4+	3	9, L&S	5	4	8+, L&S	6-	1+	9, L&S	VS
1518	Greta	1	7	1	1	7	1	1	7-	1	I
1479	Hartford	2-	8	7, M&S	2+	7+	6, M&S	3-	6	8, L&S	MR
1482	Hunter	4	5	9, L&S	5+	3	9, L&S	6	1	-	VS

West Virginia Table 1. (Continued)

Field No.	Pedigree	8/6/82			8/16/82			8/31/82			Disease Reaction
		LB	PC	Spor. 1/	LB	PC	Spor. 1/	LB	PC	Spor. 1/	
1532	Irish Cobbler	3	5	6, L&S	5+	2	8, L&S	6	1	-	S
1405	Izstades	1	7	1	1	8	1	1	7	1	I
1346	Jemsig	3+	6	9, L&S	5+	1+	9, L&S	6	1	-	S
1302	Katahdin (R _O)	3	7	7+	4-	4	8+, L&S	6-	1+	9, L&S	S
1301	Kennebec (R ₁)	3-	7-	7+	3+	5	8, L&S	6-	1+	9, L&S	S
1432	Kenya Akabi	1	7	1	1	7+	1	1	8	1	I
1481	Keswick	3+	6-	9, L&S	5+	3	7, L&S	6-	1+	8, L&S	S
1434	Kufri Jeevan	1	8	1	1	7	1	1	7-	1	I
1435	Kufri Joyti	1	7	1	1	7	1	1	7-	1	I
1563	Libertas	1+	9	7, M&S	2-	8+	4, S&R	3-	6	7+, S&R	MR
1342	Limosa	1	6+	1	1	7+	1	1	7+	1	I
1480	Merrimac	3-	7+	9, L&S	2+	7	8+, M&S	4-	4	8, L&S	S
1539	Mohawk	3-	7	8, L&S	3-	6+	6, M&S	6-	1+	9, L&S	S
1311	Nampa	4-	5-	9, L&S	3+	6	8, L&S	4+	3	9, L&S	S
1515	Norgold Russet	4+	3	9, L&S	5+	3	8, L&S	6-	1+	9, L&S	VS
1541	Norland	4+	3	7, L&S	6	1	-	6	1	-	VS
1307	NY59 (R _O)	2-	7+	2+, L&S	3	7-	6, L&S	3+	4	9, L&S	MLR
1339	NY61	2+	7	7, M&S	4	4	8+, L&S	6	1	-	S
1385	NY63	3+	6	6+, L&S	3+	6	8, L&S	6-	1+	8, L&S	S
1310	Ona	3	6+	8, M&S	3	7-	8, L&S	6	1	-	S
1358	Penobscot	2+	7+	9, L&S	3+	5+	8, L&S	6-	1+	9, L&S	S
1306	Pentland Ace (R ₃)	1	8	1	1	7+	1	1	5	1	I
1478	Plymouth (R ₁)	4-	4	8, L&S	5+	3-	8, L&S	6	1	-	VS
1477	Pungo (R ₁)	5-	3	9, L&S	5+	3	7, L&S	6-	1+	9, L&S	VS
1476	Raratan	2+	7	9, L&S	4	3+	8, L&S	6-	1+	9, L&S	S
1386	Rosa	3+	5	8, L&S	4+	4	7+, L&S	6	1	-	S
1314	Russet Burbank	2+	7-	7+, L&S	4-	4	8+, L&S	5+	1+	9, L&S	S
1529	Russet Rural	3+	6	8, L&S	4+	4	8, L&S	6-	1+	9, L&S	S
1413	Russette	3+	4	9, L&S	4+	2-	8, L&S	6-	1+	9, L&S	S
1318	Saco	4-	5	9, L&S	3+	4	8+, L&S	5+	1+	9, L&S	S
1533	Superior	5-	3	9, L&S	6	1	-	6	1	-	VS
1412	Surchip	3+	5-	9, L&S	5+	1+	8, L&S	6	1	-	S

Field No.	Pedigree	Foliar Reaction										Disease Reaction
		8/6/82			8/16/82			8/31/82				
		LB	PC	Spor. $\frac{1}{-}$	LB	PC	Spor. $\frac{1}{-}$	LB	PC	Spor. $\frac{1}{-}$		
1460	Tobique	4+	3	9, L&S	5+	4	9, L&S	6-	1+	9, L&S	VS	
1538	Wauseon (R ₁)	4+	3	8, L&S	6	1	-	6	1	-	VS	
1316	York (R ₁)	4+	2	9, L&S	6	1	-	6	1	-	VS	
<u>Tarn Andigena Material</u>												
1343	Al05	1	8	1	1	8+	1	1	7+	1	I	
1519	Al32	1	8	1	1	7+	1	1	7	1	I	
1340	A203	1	8-	1	1	7+	1	1	7+	1	I	
1589	A249	1	9	1	1	9	1	1	9	1	I	
1349	A276	1	9	1	1	9	1	1	8+	1	I	
1523	A298	1	9	1	1	8	1	1	7	1	I	
1522	A453	1	8	1	1	7	1	1	5	1	I	
1590	A505	1	9	1	1	9	1	1	7	1	I	
1341	A541	1	8-	1	1	7	1	1	7+	1	I	
<u>Plastid Andigena Material</u>												
1595	Al40-4	1	9	1	1	8+	1	1	8	1	I	
1597	Al40-6	1	6	1	1	5	1	1	4	1	I	
1593	Al40-11	1	9	1	1	8	1	1	7	1	I	
1596	Al46-9	1	8	1	1	7	1	1	6	1	I	
1598	Al58-1	1	8	1	1	8	1	1	6	1	I	
1592	Al82-4	1	9	1	1	9	1	1	9	1	I	
1594	S377-41	2+	7+	8, L&S	3+	6	8+, L&S	5+	2+	9, L&S	S	
<u>Maine</u>												
1410	AF236-1	1	8+	1	1	7	1	1	6	1	I	
1408	AF238-66	4+	2+	7, L&S	5+	1+	8+, L&S	6	1	-	S	
1411	AF307-5	1	8+	1	1	5-	1	-	1	-	I	
1428	AF330-8	3+	5	9, L&S	4+	3	9, L&S	5+	1+	9, L&S	S	
1566	AF332-11	4+	3	9, L&S	5+	1+	8, L&S	6	1	-	VS	

West Virginia Table 1. (Continued)

Field No.	Pedigree	Foliar Reaction														Disease Reaction
		8/6/82				8/16/82				8/31/82						
		LB	PC	Spor.	1/	LB	PC	Spor.	1/	LB	PC	Spor.	1/			
1570	AF339-5	3	5	8	L&S	4+	3	8	L&S	6	1	-	-	-	S	
1467	AF339-11	2+	7+	6	L&S	3	5+	7	L&S	5-	3	9	L&S	-	S	
1573	AF398-3	1	8+	1		1	8	1		1	6	1			I	
1489	AF398-5	1	8	1		1	7	1		1	4	1			I	
1565	AF424-5 (Rus)	4+	3	8	L&S	5+	1+	8	L&S	6	1	-	-	-	VS	
1547	AF426-1	1	5	1		1	5	1		-	1	-	-	-	I	
1545	AF428-12	1	6	1		1	6	1		1	3	1			I	
1425	AF431-4	4+	4	9	L&S	4+	3+	8	L&S	5-	3	9	L&S	-	VS	
1474	WF530-3	3	6-	9	L&S	3+	4+	7	L&S	6-	1+	9	L&S	-	S	
1555	WF564-3	1	5	1		1	3	1		-	1	-	-	-	I	
USDA																
1514	B5141-6 (Lenape)	4	4	9	L&S	5+	3-	8	L&S	5+	3+	7	L&S	-	VS	
1333	B8686-8	3+	7	7	L&S	4+	4	6	M&S	6	1	-	-	-	S	
1335	B8848-2	1	8+	1		1	8	1		1	7	1			I	
1332	B8934-4	4+	3	9	L&S	5+	2-	8	L&S	6	1	-	-	-	VS	
1561	B8966-3 (Rus)	1	8	1		1	6	1		-	1	-	-	-	I	
1330	B8972-1	4+	3	9	L&S	6	1	-		6	1	-	-	-	VS	
1559	B9116-6	4	4	7	L&S	5+	2+	8	L&S	6	1	-	-	-	VS	
1557	BR5967-7	5-	2	9	L&S	5+	2+	8	L&S	6	1	-	-	-	VS	
1495	BR6463-2	1	7	1		1	5	1		1	5	1			I	
1507	BR6820-26	4	3	9	L&S	5	3	7+	L&S	6	1	-	-	-	VS	
1506	BR7085-1	1	8	1		1	6	1		1	3	1			I	
1317	X96-56	4+	2	9	L&S	6	1	-		6	1	-	-	-	VS	
West Virginia																
1312	B3682-WV1	1	7	1		1	6	1		1	3	1			I	
1540	B3720-WV1	1	7	1		1	7	1		1	5	1			I	
1309	B5662-WV4	1	7+	1		1	8	1		1	8	1			I	
1509	B5663-WV13	1	8	1		1	8+	1		1	6	1			I	
1491	B6026-WV5	1	7	1		1	7	1		1	6	1			I	

Field No.	Pedigree	Foliar Reaction										Disease Reaction
		8/6/82			8/16/82			8/31/82			1/ Spor.	
LB	PC	LB	PC	LB	PC	LB	PC	LB	PC	LB		PC
1443	B6028-WV6	1	9	1	8	1	8	1	7	1	7	I
1501	B6039-WV2	1	8	1	7	1	7	1	5	1	5	I
1448	B6039-WV6	1	8	1	7	1	7	1	7	1	7	I
1516	B6039-WV9	1+	8	6	7	S&R	7	6	2	9	L&S	MR
1517	B6043-WV6	1	9	1	8+	1	8+	1	8	1	8	I
1493	B6086-WV21	1	9	1	8	1	8	1	7+	1	7+	I
1446	B6653-WV7	1	9	1	8	1	8	1	7	1	7	I
1328	B6655-WV1	1+	8+	5	7	L&S	7	1	6+	1	6+	I
1526	B6667-WV1	3+	5	8	3-	L&S	3-	9	1	-	1	S
1500	B6928-WV14	2	8	7	7+	L&S	7+	7	6	9	L&S	MR
1492	B6935-WV2	1	7	1	7	1	7	1	5	1	5	I
1315	B6949-WV3	2+	7	6	5	L&S	5	8	1	-	1	S
1356	B6949-WV7	3+	5	8	3	L&S	3	8	1	-	1	S
1357	B6960-WV2	1	9	1	8+	1	8+	1	8+	1	8+	I
1502	B6975-WV1	3+	6	9	6	L&S	6	8	5	7	L&S	LR
1319	B6988-WV10	3	6+	8	6	L&S	6	8	2+	9	L&S	S
1308	B6994-WV2	4+	3	8+	1+	L&S	1+	-	1	-	1	VS
1494	B6996A-WV6	2+	6	7	4	L&S	4	6	1	-	1	S
1503	B7019-WV1	1	8	1	6	1	6	1	5	1	5	I
1313	BR5991-WV16	1	8+	1	8	1	8	1	8+	1	8+	I
1508	BR5991-WV21	1	9	1	8+	1	8+	1	8+	1	8+	I
<u>Campbell Soup</u>												
1484	C7355-13	4	5	9	2-	L&S	2-	8+	1+	9	L&S	VS
1513	C7358-26A (Rus)	5-	2-	9	1	L&S	1	-	1	-	1	VS
1325	C7446-1	3+	4	7	1+	L&S	1+	8+	1	-	1	S
1463	C7490-2	4	5-	9	1	L&S	1	-	1	-	1	VS
1552	C7490-6P	4-	6	9	1+	L&S	1+	9	1	-	1	VS
1550	C73107-8	4-	4	9	1+	L&S	1+	9	1	-	1	VS
1485	C74109-8	1	9	1	8	1	8	1	6	1	6	I
1327	CA02-7	3+	6	9	7-	L&S	7-	8+	3	9	L&S	S

West Virginia Table 1. (Continued)

Field No.	Pedigree	8/6/82				8/16/82				8/31/82				Disease Reaction
		LB	PC	Spor.	1/ Spor.	LB	PC	Spor.	1/ Spor.	LB	PC	Spor.	1/ Spor.	
1486	CA02-8	4+	3	9	L&S	5+	1+	8	L&S	6-	1+	9	L&S	VS
1483	CA67-2	3-	7	9	L&S	4+	3	6	L&S	6	1	-	-	S
1404	CD67-2R	3+	6	9	L&S	5+	1+	9	L&S	6	1	-	-	S
1322	CD106-16	1	8+	1	1	1	7	1	1	1	5	1	1	I
1466	CF7416-3	1	8	1	1	1	7-	1	1	1	5	1	1	I
1490	CF7518-16	No Test	No Test	No Test	No Test	No Test	No Test	No Test	No Test	No Test	No Test	No Test	No Test	-
1574	CF7523-1	4	3	8	L&S	5+	1+	8	L&S	6	1	-	-	VS
1488	CF7548-11	1	8	1	1	1	5	1	1	1	5	1	1	I
1429	CF7615-4	2+	7	7	L&S	3+	6	7	M&S	4+	3	8	L&S	S
1360	CF7622-1	1	6+	1	1	1	7	1	1	-	1	-	-	I
1504	CF7622-10	1	8	1	1	1	6+	1	1	1	7	1	1	I
1475	CF7710-5	3	5	8	L&S	4+	3	8+	L&S	6-	1+	9	L&S	S
1384	CF7719-6	4+	3	7	L&S	6	1	-	1	6	1	-	-	VS
1571	CF7784-5	3	6	5	L&S	5+	1+	8	L&S	6	1	-	-	S
1422	CF7793-2	1	8	1	1	1	7	1	1	1	5	1	1	I
1572	CF7829-4	1	7+	1	1	1	7	1	1	1	5	1	1	I
1430	CF72107-15	1	7	1	1	1	5-	1	1	1	3	1	1	I
1383	CF72111-15	4	5	5	L&S	4+	3+	8+	L&S	6	1	-	-	VS
1556	CF76114-4	1	6	1	1	1	4	1	1	-	1	-	-	I
1487	CF76126-1	1	8	1	1	1	7+	1	1	1	7+	1	1	I
1464	CF77110-5	1	3	1	1	1	3	1	1	-	1	-	-	I
1426	CF72111-5	3+	5	9	L&S	4+	4	9	L&S	6	1	-	-	S
1382	CF77127-3 (Rus)	4+	5	9	L&S	5+	1+	-	-	6	1	-	-	VS
1433	CF77127-4	4+	3-	9	L&S	6	1	-	-	6	1	-	-	VS
1424	CF77139-14	1	6	1	1	1	4+	1	1	1	3	1	1	I
1591	CF77143-10	3+	4	8	L&S	6	1	-	-	6	1	-	-	VS
1431	CF77146-6 (Rus)	3	6	8	L&S	4+	5	6	L&S	6	1	-	-	S
1568	CF77154-10	2+	5	7	L&S	4	4	3	L&S	6	1	-	-	S
1427	CF77159-3	3+	6	9	L&S	4+	4	8	L&S	5+	2-	9	L&S	S
1421	CF77159-9	3+	5	8	L&S	5	3	9	L&S	6	1	-	-	S
1575	CF77161-1	3-	6	8	L&S	4+	3	8	L&S	6	1	-	-	S

West Virginia Table 1. (Continued)

Field No.	Pedigree	Foliar Reaction									
		8/6/82		8/16/82		8/31/82		Disease Reaction			
		LB	PC	LB	PC	LB	PC	LB	PC		
1587	CS7533-13	1	8	1	7	1	1	1	6	1	I
1588	CS7615-4	1	9	1	9	1	1	1+	8+	8	I
1583	CS7624-16	1	6	1	5	1	1	1	2	1	I
1584	CS7685-5	1	6	1	6	1	1	-	1	-	I
1586	CS7685-6	1	8	1	6+	1	1	1	5	1	I
1582	CS7778-12	1	8	1	7	1	1	1	4	1	I
1581	CS7952-1	1	7	1	5	1	1	-	1	-	I
1585	CS7952-16	1	7+	1	6	1	1	1	4	1	I
1580	CS76148-15	1	8	1	7+	1	1	1	7	1	I
1578	CS77138-32 (Rus)	1	6	1	6	1	1	1	4	1	I
1579	"Long Dormancy"	1	8	1	8	1	1	1	7	1	I
<u>Ag. Canada</u>											
1468	F72090	2	7	7	3+	4+	8	6	1	-	S
1543	F73008	2	8	8	7	1+	5	1	7+	1	HR
1470	F73092	3	7	7	5	3+	8+	6	1	-	S
1558	F73099	3+	5	9	2-	5+	8	6	1	-	S
1542	F73104	3+	5	8	4+	3+	3	6	1	-	S
1471	F74047	3+	6	9	4	4+	9	5+	2-	8	S
1469	F74117	3+	6	6	4	3+	7	5+	2+	7	S
1544	F74123	1	7	1	6	1	1	1	3	1	I
1337	F75040	3+	5	9	3	4+	9	6	1	-	S
1548	F75077	4	4	9	2+	5+	8	6	1	-	VS
1562	F75079	4	3	6	1	6	-	6	1	-	VS
1560	F75081	4+	3	9	1+	5+	8+	6	1	-	VS
1329	F75114	3+	5	9	5+	3+	7+	4-	5	9	S
1546	F76021	4	4	6	1	6	-	6	1	-	VS
1549	F76054	3	5	8	3	4+	9	6	1	-	S
1472	F76076	3+	6	9	3	4+	8+	6	1	-	S
1473	F77002	2	7+	5	7+	2-	6	4-	4-	8	MR

West Virginia Table 1. (Continued)

Field No.	Pedigree	8/6/82				8/16/82				8/31/82				Disease Reaction
		LB	PC	Spor.	1/	LB	PC	Spor.	1/	LB	PC	Spor.	1/	
<u>West Virginia "I" Material</u>														
1456	WVI 2-5	1	7	1		1	6+	1		1	7	1		I
1440	WVI 2-14	1	9	1		1	7	1		1	7	1		I
1444	WVI 2-24	1	9	1		1	8	1		1	6	1		I
1365	WVI 2-25	1	9	1		1	8	1		1	7	1		I
1449	WVI 2-35	1	9	1		1	8	1		1	8	1		I
1441	WVI 2-40	1	9	1		1	9	1		1	8+	1		I
1447	WVI 5-9	1+	9	1	S&R	1	8+	1		1	7	7+, M&S		HR
1390	WVI 5-12	1	9	1		1	9	1		1	6	1		I
1510	WVI 6-11	1	8	1		1	7	1		1	7	1		I
1389	WVI 6-19	1	9	1		1	9	1		1	7+	1		I
1512	WVI 6-21	1	9	1		1	9	1		1	8	1		I
1442	WVI 6-31	1	9	1		1	9	1		1	9	1		I
1445	WVI 6-38	1	9	1		1	8	1		1	5	1		I
1392	WVI 7-84	1	8	1		1	8	1		1	8	1		I
1372	WVI 8-3	1	7+	1		1	7	1		1	3	1		I
1397	WVI 8-11	1	8	1		1	8+	1		1	6	1		
1373	WVI 8-13	3+	6	6	M&S	4-	5	8	L&S	3	3	9	L&S	S
1370	WVI 8-20	1	9	1		1	8	1		1	8	1		I
1367	WVI 8-26	1	9	1		1	9	1		1	8+	1		I
1381	WVI 8-27	1	7+	1		1	8	1		1	7	1		I
1371	WVI 8-29	1	9	1		1	8	1		1	7+	1		I
1368	WVI 8-30	1	8+	1		1	7	1		1	6	1		I
1361	WVI 9-3	1	9	1		1	9	1		1	8+	1		I
1376	WVI 10-1	1	7+	1		1	8	1		1	5	1		I
1394	WVI 11-15	1	9	1		1+	8	1+	S&R	1	7	1		I
1378	WVI 11-25	1	8+	1		1	8	1		1	8	1		I
1380	WVI 11-37	1	8	1		1	8	1		1	8	1		I
1369	WVI 11-46	1	7+	1		1	8	1		1	6	1		I
1374	WVI 11-48	1	9	1		1	8	1		1	8	1		I
1379	WVI 11-49	1	7	1		1	7	1		1	6	1		I

West Virginia Table 1. (Continued)

Field No.	Pedigree	Foliar Reaction												Disease Reaction
		8/6/82				8/16/82				8/31/82				
		LB	PC	Spor. <u>1/</u>	LB	PC	Spor. <u>1/</u>	LB	PC	Spor. <u>1/</u>				
1375	WVI 11-51	1	9	1	1	8+	1	1	6	1		I		
1362	WVI 11-53	1	8	1	1	9	1	1	7+	1		I		
1320	WVI 11-56	1	8+	1	1	8+	1	1	8+	1		I		
1359	WVI 11-65	1	9	1	1	8+	1	1	8+	1		I		
1321	WVI 11-66	1	7	1	1	6+	1	1	5	1		I		
1438	WVI 11-71	1	9	1	1	9	1	1	8	1		I		
1403	WVI 12-2	1	7+	1	1	7-	1	1	5	1		I		
1377	WVI 15-2	1	8+	1	1	8	1	1	8	1		I		
1439	WVI 15-4	1	9	1	1	7	1	1	8	1		I		
1396	WVI 15-7	1	8	1	1	7	1	1	7+	1		I		
1437	WVI 15-14	1	9	1	1	8	1	1	8+	1		I		
1398	WVI 15-15	1	8+	1	1	8+	1	1	6+	1		I		
1399	WVI 15-16	1	9	1	1	8+	1	1	6	1		I		
1436	WVI 15-31	1	9	1	1	9	1	1	9	1		I		
1363	WVI 16-1	3+	7	3, L&S	2-	8	8, M&S	4	4	9, L&S		S		
1511	WVI 16-3	1	8	1	1	8+	1	1	7	1		I		
1366	WVI 16-7	1	9	1	1	9	1	1	8	1		I		
1391	WVI 16-16	1	9	1	1	8	1	1	8	1		I		
1525	WVI 16-17	1	8	1	1	6+	1	1	4	1		I		
1364	WVI 16-19	1	8+	1	1	9	1	1	8+	1		I		
1442	WVI 16-22	1	9	1	1	8	1	1	8+	1		I		
1388	WVI 16-23	1	4	1	1	3+	1	1	4	1		I		
1401	WVI 16-28	1	9	1	1	6+	1	1	5	1		I		
1395	WVI 16-42	3+	7	8, M&S	4+	4	7, M&S	3	6	9, L&S		I		
1400	WVI 16-44	1	8	1	1	6+	1	1	4+	1		I		
1393	WVI 16-47	1	9	1	1	8	1+	1	8	1		I		
1415	B5444-10 (R ₂ R ₄)	1	5+	1	1	6	1	1	2	1		I		
1417	B5444-16 (R ₁ R ₂ R ₃ R ₄)	1	4	1	1	3	1	-	1	-		I		
1419	B5444-35 (R ₁ R ₂ R ₃ R ₄)	1	6	1	1	6	1	-	1	-		I		
1418	WV 5-3	1	5	1	1	5	1	1	3	1		I		

West Virginia Table 1. (Continued)

Field No.	Pedigree	Foliar Reaction									
		8/6/82			8/16/82			8/31/82			Disease Reaction
		LB	PC	Spor. $\frac{1}{-}$	LB	PC	Spor. $\frac{1}{-}$	LB	PC	Spor. $\frac{1}{-}$	
1420	WV 11-32	1	3	1	1	4	1	1	2-	1	I
1345	WV 14-17	1	7+	1	1	7	1	1	7+	1	I
1304	3Rc-8 (R ₂)	1	8	1	1	7	1	1	5+	1	I
1305	1563 _C -14 (R ₄)	2+	7	7+, M&S	3	5+	7+, L&S	4+	3	8+, L&S	S

$\frac{1}{-}$ LB = Late blight rating: Scale 1-6, 1 = no blight; 6 = dead, result of late blight.

PC = Plant condition: Scale 1-9, 1 = plants dead, not due to late blight but other causes; 9 = excellent plant condition, foliage green and vigorous.

Spor. = Sporulation: Scale 1-9, 1 = no sporulation; 9 = excellent sporulation.

Lesion Characteristics: L&S = large and spreading - <18.7 mm (0.15")
M&S = medium and spreading - >18.7 mm
S&R = small and restricted - >6.25 mm (0.25")

$\frac{2}{-}$ General disease reaction: VS = very susceptible
S = susceptible
R = resistant
LR = low multigenic
MR = moderate multigenic
HR = high multigenic
I = immune

Genetics, Cytogenetics and Physiology of the Tuber-bearing Solanum Species
(Cooperative USDA-ARS and Wisconsin Experiment Station)

The genetics of Endosperm Balance Number (EBN). Diploid-diploid crosses were made between two sympatric species in Series Commersoniana: Solanum commersonii (cmm) and S. chacoense (chc). The EBNs of these species are 1 and 2, respectively, and any 2x x 2x cross between these species should fail due to endosperm abortion. Seeds are expected only when exceptional fertilization events occur. Approximately 1100 crosses were made between these two species. The crosses utilized primarily cmm as the female parent due to stylar inhibition of cmm pollen in chc styles. These crosses yielded a total of 54 seeds of which 34 (63%) were triploid, 19 (35%) diploid and 1 (2%) monoploid. The 19 diploid plants were comprised of 5 chacoense-like plants, 3 commersonii-like plants, and 11 which appeared to be true F_1 's.

Of the 11 F_1 's, the four most vigorous and fertile plants were entered into a complete diallel along with the species parents, thus allowing all possible combinations of sibbing and backcrossing to be done. Groups of ten fruit from each cross were selected and tabulated for the number of good and aborted. A seed was judged to be aborted by either of two criteria: 1) a failure of development beyond an early stage resulting in no endosperm or embryo development, or 2) a totally collapsed mature sized seed.

An added aspect of interest was the apparent variation in seed size within and between crosses. The trends observed were: 1) F_1 x F_1 crosses--moderate seed set, segregation for seed size, seeds out-numbering aborts; 2) F_1 x cmm--similar seed set to sib-matings, generally small seed, aborts out-numbering seeds; 3) cmm x F_1 --very low seed set, developed seeds generally large, aborts greatly out-numbering seeds; 4) F_1 x chc--low seed set, average to large seeds, aborts greatly out-numbering seeds, and 5) chc x F_1 --low to moderate seed set, generally small seed, aborts out-numbering seeds. The non-reciprocity of seed size and seed set in backcrosses argues for the involvement of more than a single gene; however, the ease of making these same backcrosses to either parent argues strongly that a very limited number of genes are involved.

Utilization of 1EBN germplasm. The incorporation of 1EBN germplasm into useful breeding materials falls into two presumably discrete categories: 1) transfers from Series Etuberosa material into cultivated material and 2) transfers from Mexican diploids and S. commersonii into cultivated material.

Series Etuberosa presents some modest problems to germplasm transfer due to the failure of pairing between Etuberosa and tuber-bearing genomes in interspecific hybrids and the resultant infertility. Using a $2n$ gamete approach, a $3x$ S. brevidens-S. chacoense hybrid (brd₂chc) was crossed with a $4x$ Tuberosum (tub) cultivar, "Wis AG 231" yielding a pentaploid hybrid. The genomic constitution of this hybrid (2 brd, 1 chc, 2 tub) should allow both tuber-bearing and non-tuber-bearing genomes to pair. The observed fertility of the hybrid (37% stainable pollen) appears to reflect this. The pentaploid is female fertile with $4x$ cultivars and produces seed at low but acceptable levels. The pentaploid hybrid and backcross hybrids with Tuberosum were planted in the field in the summer of 1982 for observation and evaluation.

In the field, the pentaploid clones bore a strong resemblance to Tuberosum but with a reduced canopy. This hybrid tuberized successfully although tuberization occurred quite late. This is the first indication to our knowledge that the non-tuber-bearing habit is not dominant and that tuberization in hybrids bearing Etuberosa germplasm has a dosage or threshold effect. Two interesting features of the hybrid, 1) flowering tubers and 2) second growth and knobiness of tubers reminiscent of "topiary" mutants may implicate unusual hormonal regulation of tuberization in this plant.

Progeny of backcrosses to Tuberosum were for the most part indistinguishable from Tuberosum morphologically. Generally, these progeny exhibited increased tuber size, second growth reminiscent of their brevidens hybrid parent, reduction of stolon size and length, and possibly earliness.

Assignment of Endosperm Balance Numbers (EBN) to tuber-bearing Solanum species. Endosperm Balance Numbers (EBN) are being assigned to the species in the IR-1 collection based on their crossability to several species or clones which are used as EBN standards. In this particular study, the 1EBN standard used was $2x$ S. cardiophyllum ssp. cardiophyllum; the 2EBN standard used was $2x$ S. chacoense, and the 4EBN standard used was $4x$ S. chacoense or $4x$ S. tuberosum Group Andigena. Each species to be tested was crossed with all of these standards. The seed set and the ploidy of the progeny was determined.

Based on the accumulated data, the EBNs for 42 species in eight series have been established. No species have been assigned to more than 1 EBN level based on the data accumulated so far. All species cross more freely and have higher

seed set at one EBN level than at another, even though they may cross to two different EBN standards. S. curtilobum may be an exception and its crossing behavior can be explained based on its presumed origin.

The North American species seem to be markedly different in EBN from the South American species. In South America, only two tuber-bearing diploid species are known to be 2x 1EBN, while among the North American diploid species 2x 1EBN seems to be the rule. At the tetraploid level again only one 4x 2EBN species is known among the South American tetraploid species, but the majority of the North American tetraploid species appear to be 4x 2EBN. This finding explains the major crossing difficulties so inherent in the past in the use of North American species in potato improvement.

Genetics of synaptic (sy 2) mutant in S. commersonii. The genetics of the synaptic variant found in S. commersonii PI 243503, has been determined. This mutant, as described previously, forms essentially no bivalents in microsporogenesis. Multipolar branched spindle configurations are observed at telophase I resulting in the formation of from 1-7 pollen grains. The pollen formed is mostly sterile presumably due to the random segregation of chromosomes at anaphase I.

A partial diallel was completed to determine the genetics of this meiotic variant. A detailed cytological analysis of each plant was completed for two families and was done for each plant exhibiting male sterility in five other families. The resulting data fit a 3 normal:1 mutant ratio; thus, this character can be explained by a single recessive gene, which we are terming 'sy 2'. Based on crossing data, it appears that the mutant types exhibit moderate to complete female sterility which suggests that this mutant may also affect megasporogenesis.

A second meiotic variant discovered in S. commersonii, PI 243503. In the partial diallel of S. commersonii, PI 243503, seedlings used to determine the genetics of the synaptic mutant 'sy 2', a second synaptic variant has been found. This variant expresses no pairing of homologues during meiosis and appears to lack spindle formation. It appears that no meiotic stages occur after late prophase. No metaphase stages were observed, but rather a thickened cell wall formed without cell division and shortened chromosomes were observed inside of the thick walled cells. It is presumed that due to lack of a spindle, no cell plate could be formed,

and thus no cell division could occur; hence, resulting in the direct formation of a $2n$ pollen grain. Pollen stainability was good among these variants. This variant appears to be due to a single gene recessive and probably is independent of 'sy 2'. Genetic analysis needs to be completed on this mutant.

Low-temperature germplasm preservation. Methods have previously been developed for obtaining survival and germination after cryogenic exposure of isolated shoot-tips from S. tuberosum Groups Andigena, Phureja, Stenotomum, and Tuberosum. Since an in vitro culturing phase is necessary to allow surviving cells within the shoot-tip to grow and produce a plant, evaluation of regenerants is necessary to determine if any variability is induced by the cryogenic/culturing regime. Approximately 1000 clones derived from treated shoot-tips of the cultivars Red Pontiac and Norland were transplanted to the field for observations. Shoot-tip treatments included no cryogenic manipulations (control), dimethylsulfoxide (DMSO) exposure, and DMSO exposure combined with cooling to either -30°C , -40°C , or -196°C . Only 1 of these 1000 regenerants was grossly abnormal. Leaf color, leaf morphology, time-to-flowering, height, and yield were similar among all other regenerants. Electrophoresis of tuber-proteins is being conducted to determine whether any variation is detectable. Methods for shoot regeneration continue to be evaluated. The zeatin-containing regeneration medium has been tested for a range of S. tuberosum genotypes and has given varying percentage of shoot regeneration for these materials. Several different species have been introduced into in vitro culture to assess: 1) variation in cryo-treated tip regenerants from species other than S. tuberosum, and 2) survival after cryogenic treatment in relation to cold hardiness of the species.

Somatic cell genetics. Methods of protoplast isolation, culture, and regeneration continue to be examined in diverse species of the tuber-bearing and related Solanum species. Mesophyll protoplasts have been successfully isolated from in vitro cultures of 36 lines representing six species. Yields, percentage survival, callus formation, and regeneration frequency vary from line to line. Russet Burbank and an R_4 blight differential have been used for several isolations and have also shown variation in the above categories. Regenerants from Russet Burbank were examined in the field for extent of variation--over 30% of these lines exhibited noticeable variation in plant size, leaf shape-size-and color, time of flowering, and tuber characteristics.

Regenerants from other lines will be examined to determine frequencies and types of variants.

Protoplast fusions are currently being studied from several lines utilizing both mesophyll protoplasts and suspension culture-derived protoplasts. Protocols for exposure of protoplasts to fusion regimes are being developed using fluorescent dyes as markers for identifying fusion products.

Solanum tuberosum protoplast survival and regeneration has been studied for purposes of somatic cell genetics and basic cryobiological studies on cryoinjury. Modifications of published methods have been extensive and have culminated in a system with high protoplast yields, high percentages of protoplast viability, and a high percentage of regeneration to callus. Shoot regeneration from these calli has been almost 100%. These responses occur at higher plating densities (ca. 1×10^5 /plate).

The above is joint research with Dr. J. P. Helgeson, Plant Physiologist, USDA-ARS, Madison.

